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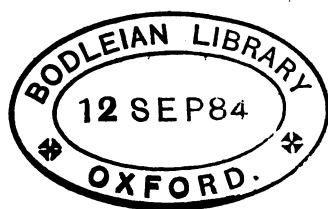
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LONDON
J. & A. CHURCHILL
11 NEW BURLINGTON STREET
1884

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15-11-1884



PREFACE.

A CONSIDERABLE PORTION of this work is formed by the matter of two lectures given by me at the Royal College of Surgeons in June of the present year. Of these lectures the medical journals presented condensed reports, embracing about one-half of the original composition.

I now present the lectures entire, although not preserving the exact form in which they were delivered, since numerous additions were rendered necessary, in order to elucidate the subject treated of more fully than it is possible to do in the narrow limits allotted to oral communications. Besides these, I have appended notes, histories, tables of cases, etc., as well as many illustrations from microscopic and other specimens exhibited by me in the College Theatre.

LONDON : 35 WIMPOLE STREET, W.

July 1884.

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TUMOURS OF THE BLADDER.

CHAPTER I.

DIAGNOSIS.

Necessity for systematic inquiry into and observation of symptoms—
Scheme for examining them—Physical examinations—Relief of
obscure and painful symptoms—A case—Tactile examination of
interior of bladder—A case resulting in removal of vesical tumour
—Considerations as to the best means of accomplishing it.

It is a fact which now begins to appear somewhat surprising, that, until a very recent period, the subject of tumours of the bladder has received a comparatively small share of attention, either from pathologists or from practical surgeons. The former have noticed these morbid products, chiefly to remark on their rarity; the latter have alluded to them chiefly, as, for the most part, beyond the power of art to remove. Yet there is little doubt that these growths are by no means uncommon, and recent experience is teaching us that surgical treatment may often greatly palliate, and sometimes successfully extirpate, the disease.

It must be admitted that these cases are almost invariably somewhat difficult to identify, especially in an early stage. Hence the reason why so little information has hitherto been acquired respecting them. But of late years, keener observation and analysis of the signs and symptoms of disease have led to the discovery of various morbid conditions not before suspected to exist ; and it is owing to this fact that the presence of tumours in the bladder has been verified, and that the frequency of their occurrence has been demonstrated.

Before commencing a study of the various products which are grouped under the title of tumour, I shall consider the important preliminary inquiry of how best to ascertain their presence in the bladder, and separate the signs and symptoms proper to them from those of other affections, whether obvious and simple, or unusual and obscure.

In all cases of disease, whatever its seat or nature, our first object in examining a patient is to form a diagnosis of his disease by investigating its phenomena. The account which he gives of his sensations is critically received and noted ; the physical signs which relate to the performance of function, as well as those which denote some change in form and structure, are observed, and the secretions are chemically and microscopically examined.

These data being obtained, the diagnosis is

generally clear. If it is not so, the defect is rarely due to our want of scientific knowledge of disease, but to our inability to obtain the facts required in the particular case. Thus the diagnosis of heart and lung diseases was very obscure, although their pathology was well understood, until the practice of auscultation and percussion revealed facts which had not been hitherto attainable during life. Hence it is now rare to meet with serious disease of those organs which, after adequate examination, can be termed obscure.

But in affections of the kidney and bladder, accessible as these organs are to inquiry, the one by sounding, the other through its secretion, it is still by no means uncommon to meet with a group of symptoms indicating serious disease, of which the diagnosis is by no means clear. The disease shall have existed for months, or even for years ; careful examinations shall have been made by several observers, and yet, not only shall there be no agreement among them as to the nature of the affection, but differences of opinion may exist as to its locality ; for example, as to whether the bladder or the kidney is the chief seat of the malady.

These obscure diseases, as already intimated, are for the most part chronic in their character. There is rarely any question of obscurity when dealing with acute disease, since the local pain and other signs, as

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TUMOURS OF THE BLADDER

of urine analysis, which it cannot be necessary to pursue further in this place.¹

Sixthly, inquiry must be made for the presence of pain in the back, loins, and hips, past or present, permanent or transitory, and for the occurrence of periodical attacks, obviously renal.

Lastly, signs of dropsy and other complications of imperfect renal function must be sought.

The prosecution of these inquiries, and especially made in this order, decides for a great number of cases the condition of the patient, but it will not do so in all. Physical examination is in some cases necessary : it is so when the stream of urine is habitually small, when micturition is frequent, painful, and difficult, when also it is feeble in elderly men ; if obstruction is manifest in any case, if the urine be persistently alkaline and muco-purulent, if red blood is passed in the urine, and especially if symptoms of irritated bladder are also present.

The steps of physical diagnosis are very simple, easy of performance, and, although often much dreaded by the patient, entail only a moderate degree of pain when properly executed, and rarely any risk of exciting febrile or other disturbance if they are employed under certain conditions, *e.g.* with exceeding gentleness, not during the presence of local inflam-

¹ See *Clinical Lectures*, by the Author, Lect. XXIV. 7th edition. London : Churchill, 1883.

mation, and with due precautions for the patient afterwards.

Adequate patency of the urethra is determined by passing a soft bougie of moderate size ; ability of the bladder to empty itself by the natural efforts by passing a flexible catheter immediately after the act of micturition ; the presence of a foreign body by introducing a small beaked sound and prosecuting the search in a systematic but delicate and gentle manner. The condition of the prostate and base of the bladder is ascertained by rectal examination with the finger, searching there for hypertrophy, cancerous deposit, and for calculus in exceptional circumstances, such as impaction, irregular situation, unusual size, &c. Examination of the perineum and scrotum, as well as palpation and percussion of abdomen in the suprapubic region, and in both renal regions, in the line of the ureters, for retained urine, tumour, enlargement, fluctuation, points of tenderness, &c.

The outline of an exhaustive scheme of research has thus been presented ; one which suffices for the solution of a very large proportion of all the cases which occur in practice. I think it may be fairly said to be adequate to the solution of ninety-nine out of one hundred, so far as a rough numerical estimate be possible.

But it follows that the most patient application of the inquiry described sometimes fails to reveal the

cause of symptoms ; although it may, and often does, arouse suspicions as to what that cause may be. Thus, the evidence available in an exceptionally obscure case may point in the direction of impacted calculus, which is associated usually with extremely painful and frequent micturition, and muco-purulent or occasionally blood-stained urine ; or may indicate the presence of a growth within the bladder (not cancerous deposit in its walls, which is readily recognised from the rectum), such growth being usually associated with long-continued or repeated bleeding, and sooner or later depositing in the urine organic débris, the structure of which may determine its character. In either case no permanent relief is attainable without operation.

Besides the conditions named, there may be, as in the cases of elderly men who are unable to pass any urine without very frequent catheterism, another cause, not very infrequent, of the most distressing cystitis ; one that is rarely amenable to relief by ordinary treatment, because the cystitis itself is maintained by the very agency, the catheter, without which the patient's existence is impossible. A vicious circle of actions is thus set going, which can only move from bad to worse. In all the conditions described the patient's fate is sealed ; but even this grave fact does not disclose all the severity of his lot ; since it is almost inevitable that the fatal event

must arrive through severe and protracted suffering. The painful experience which I have necessarily had of so much misery of this kind, and for which, in the later stages of disease, little relief is afforded except through the influence of narcotics, has long impressed me strongly with the desire and the hope of finding the means of escape for some of these patients, equally from the fatal issue and from the suffering which precedes it.

Fifteen years ago (January, 1869), for a man about 60 years of age, in University College Hospital, I first opened a bladder with the sole view of affording relief in a case of painful cystitis of the kind described, no crisis of retention being present ; by making a suprapubic opening and maintaining a tube there during some weeks, in order to drain and relieve the bladder. I repeated this proceeding in six other cases, affording some relief, but with less of permanent benefit to patients than I had hoped to attain. The opening was ill-placed for drainage purposes ; it became very sore from contact with urine, and kept the patient for the most part confined to his room. But the last case in which I did this operation was so remarkable, and impressed me so strongly, that from that time I determined on a different course for the future ; and this at length issued in the plan which I have now put in practice nearly four years, and the results of which I shall lay

before you without any reserve to-day. But first, I shall ask you to listen to a very brief report of the case just referred to.

Mr. C. was aged 31 when first seen by me in 1870. During the previous six years has had occasional attacks of bleeding. The urine always more bloody at the end of the stream than at the beginning. The vesical origin of the blood was on this ground suspected at that time.

After two or three visits, he took a sea voyage for his health, and thought himself cured. But he came again in October 1874, having had several fresh attacks recently. I sounded him, and felt nothing; some fusiform cells were observed in the urine, and are sketched in the note-book at that visit.

1876. Has continued to bleed, and more frequently. Found three ounces of residual urine, and advised use of catheter daily; which was found to check bleeding, as when there was no straining there was no blood.

1877. Passes shreds of organic tissue; sounded, nothing felt; weaker; micturition frequent and painful.

1878. Sufferings so great in micturition that I resolved to make a suprapubic opening into the bladder to rest and drain it, and enable him to obtain some sleep, which has been terribly broken by constant straining. The operation afforded some relief, but he gradually became weaker, and sank about a month afterwards.

At the autopsy a single pedunculated tumour was found in the bladder; it resembled in form and size an ordinary fig. It could have been easily removed had the suprapubic opening been enlarged (see fig. 1).

It was clear to me from this case that the ordinary sound, 'a lengthened finger' in practised hands, as I had often and truly termed it to my class, had proved

incapable of giving me sufficient information relative to the presence of a considerable growth within the



FIG. 1.—Fimbriated Papilloma, with narrow peduncle. From case of Clark, æt. 38. (Museum of University College, No. 1,500.)

bladder. Supposing that I could but once have put my real finger there, instantly discovering, as I should have done, that easily removable tumour: how different would have been the issue of that unhappy case! He might have been enjoying life and health to-day. What then was to prevent me in future, under circumstances of equal gravity and like obscurity, from determining the presence or absence of such a growth, by the direct sense of touch, as I could so easily have done there, had the necessity for applying it ever occurred to me? The questions therefore naturally presented were: Might it not be possible to examine with my finger the whole interior surface of the bladder; and, if so, from what region could such exploration be most easily and safely accomplished—from the perineum, or from above the pubes? After experiment on the dead body the answer seemed not doubtful. With a small

opening into the membranous urethra from the perineum, just large enough to admit the finger to arrive at the neck of the bladder, and making at the same time firm suprapubic pressure, I could explore without difficulty every portion of the surface described. If then by means of anæsthesia I could attain that degree of flaccidity and inertia in the living body which is natural to the dead subject, why should I not be able to effect as easily the exploration in the former case as in the latter ?

Opportunity for making the experiment soon occurred, partly in the course of a lithotomy case or two ; and finally in the person of a patient who came under my care in 1880, with severe and obscure symptoms. At the outset of this case I met with a small calculus and crushed it, but subsequently found another, as I thought, impacted, not being able to remove it by the lithotrite. It was with the object of ascertaining the real state of the case that I decided thus to explore the bladder, and did so in November of that year. I invited Dr. Seegen, of Vienna, and Dr. Paggi, of Florence, who happened to be in town, as well as Mr. Ceely, of Aylesbury, to be present. Having made the median incisions, and complete flaccidity of the abdominal muscles having been attained by the influence of ether, I felt as soon as the finger entered the bladder that there was no difficulty in exploring the whole interior, and soon detected the

presence, not of a stone, but, to my surprise, of a single pedunculated tumour of considerable size, with a thick coating of phosphates deposited on the surface. It had been this coating, together with the immobility of the mass as previously determined by a lithotrite, which had suggested to me the presence of impacted calculus. I seized the tumour with a small lithotomy forceps and twisted it off at the neck. The patient, contrary to my expectations, made a rapid recovery; had no return of the growth or any sign thereof, and has enjoyed excellent health and activity ever since, as he does at this day. That operation took place in the autumn of 1880, now nearly four years ago. I waited a year and a half before presenting this man and his history to the fellows of the Royal Medical and Chirurgical Society, and before proposing also to make his case a precedent to be followed systematically in obscure cases for the future, having at this second date adopted the operation in three other cases of chronic bladder disease, which, however, were not examples of tumour in any form. The case, with diagram of the growth removed, forms No. 1 in the Table of Cases at the end of this volume.

I then determined to regard the systematic examination of the bladder by means of the finger as a desirable, and indeed as a necessary, proceeding in obscure disease believed to affect the bladder, when

other means, including careful sounding under ether, had failed to detect the cause. And in order to distinguish the new method, I termed it 'Digital Exploration of the Bladder,' and under this name I made the first published account of it, not in this country, but in *La Semaine Médicale* of Paris, in June 18, 1882; specifying also the cases in which it might be deemed applicable.

In the surgical proceeding itself there is nothing new, nor did it ever occur to me that it could be claimed in that sense by any modern surgeon. Like others I had often opened the urethra from the perineum for stricture, for chronic and obstinate urinary fistulæ, for impacted calculus, for calculus sacculated in front of the neck of the bladder, and once after lithotrity when the patient could pass no urine except by catheter, and was unable to introduce the instrument, &c. But the object with which I have recently proposed to operate is a new one, inasmuch as it is solely the exploration of every part of the bladder with the end of the finger, in order to diagnose its condition, and not by any means necessarily to perform any further operation, unless indeed this should turn out to be required by the discovery of a tumour or other condition admitting of surgical treatment. To effect this purpose, then, it was extremely important to determine what is the shortest and easiest route for the surgeon, and at the same time by what

method would the smallest amount of risk to the patient be incurred.

At first sight it appeared that an incision involving the neck of the bladder must be necessary, and that the operation must therefore be some form of cystotomy. Happily experiment proved that no such extended incision would be required, and that a section carried from the perineum to the urethra, in other words 'external urethrotomy,' would suffice for my purpose.¹ Now, this is a procedure almost without risk. The mere section of parts from the perineal surface in the median line, down to any part of the urethra anterior to the prostate is one of the simplest and least dangerous of surgical operations. If in addition to the section, the prostatic urethra together with the wound have to form a route for the repeated introduction of instruments, and for the removal of a tumour, the risk is increased in proportion to the amount of work to be done ; but even then the fresh danger incurred does not arise from the urethral lesion so much as from the process of detaching the growth from the walls of the bladder.

¹ It fell to my lot to write a brief history of that operation for my earliest Jacksonian prize essay in 1851, and I recorded there that it was practised in the end of the seventeenth century by Richard Wiseman in this country, and that at about the same period, and subsequently, it was known and practised in France, under the name of the 'boutonnière,' by Tolet, Colot, Petit, Ledran, and others. By all these it had been adopted to give an outlet to retained urine, and to relieve impassable stricture. My purpose, however, was wholly different, as is seen above.

In lithotomy the urethral route, and particularly the neck of the bladder, are injured by forcible extraction of a large and rough calculus, but nothing analogous to that dangerous process occurs in the removal of tumour.

Old, however, as is the surgical proceeding in question, whether in modern language it be termed 'external urethrotomy,' or, as with the older French surgeons, the quaint term of the 'boutonnière' be adopted (the term itself shows how very simple even at that period they considered it), the mode of performing it appears to me, after a considerable experience, not altogether a matter of indifference. I shall in the first place, however, premise that there is no longer any doubt that the median incision of the perineum opens a shorter road to the neck of the bladder than an incision commenced from any lateral part of that region, although the question has been raised. Considering this point to be determined, I shall describe in the succeeding chapter the steps of the proceeding which appear to me the most desirable to be followed in order to attain the end proposed with ease and safety.

CHAPTER II.

DIGITAL EXPLORATION OF THE BLADDER.

Mode of performing—Conditions which may be met with—Draining the bladder—Exploration in women—Results of exploration in forty-three cases—Brief reports of each.

THE OPERATION.—The position of the patient, and the general accessories necessary, are those required for lithotomy.

After ether has been given, a median staff with a short curve, wide and deeply grooved, is passed into the bladder, and the patient is brought down to the edge of the table, the feet and hands are attached by anklets and wristbands and held by two assistants in the usual manner, another holding the staff. The surgeon, being seated, introduces into the rectum his left forefinger, so as to feel with its tip the position of the grooved staff, separated by intervening tissues, and to verify the apex of the prostate, on which he may place the point of his finger as a guide. He may take the handle of the staff with his right hand and place it in the position required, before returning it to the hand of the assistant. Maintaining his left

index in the position described, the operator then makes, with a long, narrow, straight-backed bistoury (fig. 2), a vertical incision through the skin and

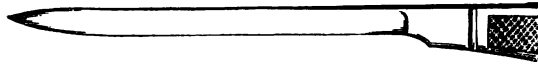


FIG. 2.

cellular tissue in the middle line, say in the raphé, about an inch and a quarter long, the lower extremity of the incision terminating about three quarters of an inch above the anus. He next enters the bistoury, with its cutting edge upwards, in a horizontal direction, at the lower part of the incision, just above the upper border of the bowel and parallel with it, and, guided partially by the proximity of the left index there, directs the point inwards until it arrives at the membranous part of the urethra, which it penetrates, entering firmly the groove of the staff. Contact being distinct, he incises the urethra on the staff for a few lines by a backward and forward movement of the point, and then withdraws the bistoury, cutting slightly perhaps a little of the tissues upwards as he does so, avoiding as far as possible any section of the bulb itself, and making room enough only for the finger to enter. He now inserts in the groove of the staff the tapering gorget-like director (which may be itself grooved in order to enter on the back of the knife which has been employed, and before the latter

has been removed) (fig. 3), and presses it gently inwards along the urethra to the bladder, and he



FIG. 3.

may at the same time remove the left index from the rectum and take the staff in that hand, so as to handle the two instruments simultaneously. The staff is withdrawn, the director maintained in place by the right hand, the left index is slowly and gently insinuated along the director through the neck of the bladder, when the director is withdrawn. The tip of the exploring finger is now in ordinary circumstances felt free in the cavity of the bladder, and not unfrequently at once comes into contact with and recognises the morbid condition for which the exploration was undertaken. Whether or no, the operator, maintaining the index in its place, and firmly pressing it into the cavity of the bladder, rises from his seat if necessary, and stands so that by means of his own right hand he can make firm suprapubic pressure, and bring the upper surface of the bladder into contact with the left index. This is easily accomplished if

anæsthesia is complete, that is, renders the abdominal muscles quite inert and flaccid. He rapidly ascertains the presence or absence of tumour ; if absent, he will by slightly changing the point of suprapubic pressure, and also as far as he can, the direction of the tip of the left index, carefully examine bit by bit the whole internal surface of the bladder. He will first be acquainted with the condition of the mucous membrane lining the cavity, and observe whether it possesses the smooth satin-like surface, so characteristic of the vesical lining membrane in health, or whether it is more or less roughened or velvety in places, for such conditions rarely affect the entire area. He may find on the contrary an irregular surface elevated in places by interlacing lines of fibres, with corresponding depressions and interstices, the signs of hypertrophy of the muscular coat ; while the existence of inequalities in the surface of any kind, such as small papillæ, or so-called ' villi,' is at the same time determined.

Further examination with the finger-nail may detach from the wall some rough-feeling material ; and a more or less substantial film may be found, to which earthy deposits adhere, like a false membrane which may be peeled off and removed. In other cases a complete scale of phosphatic crust may be encountered, rather closely attached to a roughened portion of the wall, and be separated from it without difficulty. And sometimes the finger may discover a small cal-

culus half exposed, half hidden, occupying partially, or almost completely, a little sac, or lodged in a crevice, as it were, and merely protruding from between two hypertrophied folds or rugæ, which hold it in a position where it has perhaps defied both the sound and the lithotrite. All forms of prostatic outgrowth are met with ; their interference with the vesical function can be studied, in the relations which they hold as to size and situation to the neck of the bladder ; some of them being thus possibly rendered amenable in a slight degree to surgical treatment after such recognition has been made, as is partially illustrated by a case, No. 41, at the end of this chapter.

Indeed, it is difficult to say at present what may not be found, as fresh experiences have brought to light conditions to some extent not heretofore recognised, of which I have yet to speak. Hence there are few occasions, I confess, which for me have excited a more lively interest, than the moment at which my finger enters a bladder, the condition of which has been a theme of keen inquiry and speculation, for some months or even for years before.

Almost certainly, at that moment the cause is revealed, and the practical surgeon only can understand, if I permit myself to say how grateful is the sense of satisfaction when it is suddenly discovered that the event has amply justified the procedure, and that the cause of years of suffering is judged after

examination to be safely within our power to remove. I doubt whether the keenest hunter in quest of adventure, or most indefatigable and hardy explorer of an unknown continent, realises, after long and patient toil, happier moments following success, than does the operator, who, after protracted care and research, tracks to a hidden source the cause of certainly impending death, and is able to save the victim!

To return, supposing it is at once apparent from the examination just described that tumour is present, the operator must next deliberately study its size, form, situation, and mode of attachment to the bladder. This is an extremely important matter, and will be considered, as well as the best mode of removing the growth, in the next chapter.

On the other hand, no growth having been found, the next steps of the proceeding will depend on what other morbid or irregular condition has been revealed. Supposing that either some calculus or other matter has been removed, or that the bladder and urethra are to be maintained in a state of rest in order completely to suspend their functions for a few days, free exit for the urine must be secured. For this purpose a soft but stout indiarubber tube, with a clear calibre of a fourth of an inch, having a lateral as well as a terminal opening, and about six inches long, is to be fastened with one end (smoothly bevelled) just within the bladder, the remainder occupying the wound, and

protruding so as to convey the urine direct to some vessel suitable to receive it. If the object of treatment is that last described, the tube should remain a week or so, unless its presence occasions pain, in which case a soft large catheter may be tried ; or, as sometimes happens, it is better after the first or second day to dispense with any instrument, and allow the urine to take its course through the wound. If, however, the tube produces little or no irritation, it should remain several days, until the bladder has been rested and drained, say at least for a week ; even a longer period is sometimes advantageous ; see Cases 5, 8 and 43. The relief from frequent habitual catheterism thus afforded to a patient who for months perhaps has been compelled to use a catheter twelve times or more frequently every day is so great that he often desires the period of drainage to be prolonged, and thus the term of rest to be extended. To a man who has for some months before never enjoyed two consecutive hours of sleep—and in some of these long-standing cases the term of rest does not even reach one hour—the ability to lie unmoved and be undisturbed for an unlimited period of time constitutes an indulgence which he appreciates to the utmost, and which has often the happiest effect on his digestion, his strength, and his spirits. I have seen some very remarkable examples of relief arising from the process, and relief of a permanent character.

It will be natural in this place to advert for a few moments to the analogous operation in the female when dealing with obscure forms of disease for the purposes of diagnosis and treatment. In order to accomplish a digital exploration of the female bladder all that is needful is sufficient dilatation of the urethra to admit the introduction of the index finger, which may be accomplished by means of a three-bladed dilator or otherwise, after which the facility for examining is of course greater than that attained after perineal incision in the male. Dilatation, however, always comprehends, I think, in whatever way it is rapidly performed, a certain amount of splitting or rupture of the urethra, which, however, I have never known to be followed by any permanent injury. I have thus examined five cases of women for the purpose of diagnosis, and have found tumour in two, and removed both without any further enlargement of the opening.

It has been objected by some that when the prostate is largely hypertrophied, especially in a fat subject, it is not possible to explore the bladder by means of the proceeding here described. Hypothetically the objection appears important, but my experience shows that the difficulty supposed is rarely considerable; in only one instance have I failed to reach the whole of the internal surface of the cavity.

If only the anæsthesia is complete, our purpose is

effected much more easily than most persons would *à priori* imagine. In fact, before such anæsthesia had become possible, digital exploration of the bladder would not have been proposed, and certainly could not have been accomplished. It is one of the many applications of surgical art which owe their origin solely to that influence. For if absolute and complete flaccidity of the abdominal muscles is thus attained, it is surprising how the contents of the pelvis can be pressed down towards the perineum by a strong and determined assistant, and can be reached by the operator, however large the prostate. But if the etherist permits the patient any power of resisting with the abdominal muscles, the effort is hopeless, and failure in the attempt to explore is, I believe, more likely to arise from that circumstance than from any other.

Further, it cannot be frequently necessary to make a digital exploration in cases of very large prostate, inasmuch as the cause of symptoms is generally sufficiently patent, and therefore does not call for further inquiry.

The bladder, however, may require to be drained in advanced disease of this kind ; and this is often done with great and permanent benefit ; for which purpose the small urethral incision suffices. To this proceeding the enlarged prostate offers no impediment ; but complete exploration of the bladder in such a case is not required, unless unusual symptoms

are present, which the enlargement and consequent obstruction do not suffice to explain.

RESULTS.—I shall now present, in brief terms, a list of all the cases on which I have performed digital exploration of the bladder, forty-three in number. In twenty of these tumour was found. These latter cases will only be named here, since the details concerning them will be fully given at the close of the fourth chapter. The object of the following record is to indicate all the various conditions for which the operation of digital exploration was resorted to, and the results which followed its performance.

On carefully analysing these cases there appear to be four chief forms of vesical disease, in which the operation of opening the urethra for the purpose of withdrawing the urine altogether by an artificial route, and so suspending the functions both of the bladder and urethra for a time, may render good service. Then, besides these, there remains a fifth class of cases, namely, those in which the operation is undertaken solely with the view of exploring, when the presence of tumour may be strongly suspected.

The first class consists of those cases, not unfrequently met with, in which all the symptoms of chronic cystitis have existed for a long period, and in a severe degree, and which persist in spite of long-continued and appropriate treatment ; while at the same time it is understood that the absence of

material cause for the cystitis, such as stone, stricture, vesical incompetence, &c., has been ascertained. Examples are Cases 2, 24, 31, and 43.

The second class of cases includes those examples of prostatic hypertrophy and of atony of the bladder, in which that organ must be emptied by the catheter many times in the twenty-four hours, and in which painful chronic cystitis is obviously aggravated, if not maintained, by the necessary process of relief. These are usually cases in which the disease has existed for years, and which have arrived, to all appearance, at the latest stage, unless complete relief can be afforded. Examples are seen in Cases 5 and 34.

The third class embraces those cases, less rare perhaps than they have been supposed to be, in which the existence of impacted calculus or of adhering calculous matter may be suspected, or may be known to be present by sounding. Examples are seen in Cases 3, 4, 7, 22, and 36.

In the fourth class I place those cases in which painful and very frequent micturition or bleeding, separately or combined, may have long existed; without signs of cystitis, the urine being clear, free, or nearly so, from mucous or purulent deposit; furthermore, the cause of these symptoms has baffled the most careful inquiry. On exploration being made no organic change is discovered, no light is obtained

on the diagnosis of the case, but the functions of the bladder and urethra are suspended for a week or so, and the patient gets well more or less completely. Of this remarkable history there are six examples in the series : of which three, Cases 8, 14, and 35, perfectly recovered, besides three others in which great improvement took place, but not complete recovery, Cases 17, 23, and 41. The result of operation undertaken in the circumstances described, as a last if not almost hopeless resource, has been surprising, and fraught with great interest. I am disposed to think that there are some persons in whom an attack of cystitis with extreme frequency of micturition having been set up, the want to relieve the bladder every half-hour or hour, at first natural and necessary, still continues after the local disease has passed away, in spite of their efforts to overcome it, as the result of what may be regarded as persistency of a morbid habit, in certain constitutions. I cannot further elucidate the pathological condition in any one of them, having discovered nothing by the investigation to account for the symptoms.

Besides these, one case has been already referred to, in which adhesions between the mucous lining of the bladder were separated by the finger, Case 12 ; there was one case of division of the neck of the bladder which was extremely tight and rigid, Case 41 ; and one case of hæmaturia in which the surface

of the mucous membrane was studded with numerous minute villous papillæ, removed by scraping, followed by applications of caustic, Case 37. In each of these cases considerable improvement resulted from the proceeding ; the last being completely successful.

I cannot but hope that the results reported in these histories may lead to a further employment of this simple operation in cases of like obscurity, feeling sure that much valuable relief to suffering, as well as prolongation of life, may be attained by a judicious application of the proceeding.

FORTY-THREE CASES OF OPERATION FOR DIGITAL EXPLORATION OF THE BLADDER, *performed by the author, and briefly reported, but containing the chief points of the history, progress, and results in each. In twenty instances, tumour of the bladder was met with ; in this series that fact only is named ; the details will be found in a table at the end of the fourth chapter.*

Case 1.—T. R., 29. Exploration : 1880, November 6. Tumour removed. (See Table, No. 1.)

Case 2.—J. H., 48. For several years has passed blood in the urine, and occasionally phosphatic deposits, with much frequency of micturition, chronic cystitis, &c.

Exploration : 1881, June 27. Nothing found ; tube remained a week for drainage. 1884, June 7. Very decided improvement has continued ever since.

Case 3.—C. J., 52. I performed lateral lithotomy in 1880, with Dr. Jas. W. J. Smith, of Belfast, for a large uric

acid calculus : the wound healed slowly ; subsequently passed phosphatic masses with bleeding.

Exploration : 1881, June 17. Found phosphatic deposit adhering to the walls of the bladder, and removed it with my finger ; then drained the bladder for a week ; some relief followed, but it was not considerable.

Case 4.—T. H., 68. A year ago a calculus removed from the bladder by lithotomy. Soon after recovery he had hæmaturia, continuing some months in spite of treatment. He also experienced great pain, irritation, and extreme weakness, his condition occasioning great anxiety.

Exploration : 1882, Feb. 10. Nothing found except a scale of phosphatic matter, adherent to the bladder, and I removed it with my finger. He soon recovered, and never saw blood again. Was seen with me by Sir W. Jenner. June, 1884. He called on me three months ago, stating that he was enjoying better health and activity than for years past.

Case 5.—T. H., 60. Passes all urine by catheter, many times in the day ; much phosphatic deposit and great suffering.

Exploration : 1882, March 20. Nothing whatever found in the bladder. I therefore introduced a tube, which remained there eleven days, thoroughly resting and draining the bladder. The relief was great ; he resumed active habits, and he has been better ever since. Drs. Chepmell and Barton Smith present.

Case 6.—Mrs. F., 30. Exploration : 1882, May 9. Tumour removed. (See Table, No. 2.)

Case 7.—A. S., 72. Passes all urine by catheter, with great pain and extreme frequency ; very feeble ; seen in consultation with Sir W. Jenner.

Exploration : 1882, June 21. I found a small impacted calculus, and removed it with finger ; bladder drained through tube ; great relief to pain, but died in a few days from ex-

haustion. The operation was undertaken to relieve pain, and not with any view of saving life, as he was obviously near his end.

Case 8.—C. C., 83. Micturition extremely frequent and very painful, but requires the catheter only once daily, very little urine being retained, the instrument withdrawing only one ounce and that is clear.

Exploration: 1882, June 30. Nothing found; tube retained for twelve days, after which the relief was remarkable and permanent. I have recently seen him, and he is absolutely free from symptoms.

Case 9.—B. G., 46. Exploration: 1882, November 3. Tumour removed. (See Table, No. 3.)

Case 10.—M. C., 52. Exploration: 1882, Nov. 20. Tumour removed. (See Table, No. 4.)

Case 11.—F. I., 24. History of severe hæmorrhage and very painful frequent micturition. Sent to me by Dr. Iles, of Fairford, Gloucestershire.

Exploration: 1882, Dec. 15. Dr. George Johnson present. Nothing felt, except that the whole cavity of the bladder is irregular and the lining membrane thickened. Tube retained five days; on removing it, bleeding which had ceased reappeared. The wound does not heal, some urine passing by it, partially prevented by frequent catheterism.

Case 12.—Mrs. H., 23. From New Zealand, with very severe symptoms of three years' standing; said to be due to 'polypus of bladder.'

Exploration: 1882, Dec. 19. Cavity of bladder extremely small, apparently limited by adhesions, which gave way easily under pressure of the finger at some points; a condition I never observed before; no tumour. She soon recovered, lost all pain from that time, but was compelled to pass water almost as frequently as before. Her health was much improved, and she returned in the following month.

Case 13.—E. K., 67. Exploration: 1883, January 17. Tumour removed. (See Table, No. 5.)

Case 14.—W. C., 52. Very frequent and painful micturition, without ascertainable cause, for a year past; rarely holds water more than half an hour. No hæmaturia.

Exploration: 1883, Jan. 22. Dr. Van Syckel, of New York, and others present. No morbid sign discoverable. Tube retained a week. Healed quickly; being one month afterwards absolutely free from symptoms; says he was never better in his life. He returned to the Cape of Good Hope, whence he had come purposely to consult me.

Case 15.—Miss G., 30. Severe symptoms, without ascertainable cause. Long-standing hæmaturia, evidently from bladder. Health very infirm; all treatment hitherto employed has been fruitless.

Exploration: 1883, Jan. 23. Nothing found, but thickening of mucous membrane of bladder, the result of chronic cystitis. No relief except from some of her pain. She slowly sank, and died within a month. Sent to me by Dr. Myrtle, of Harrogate.

Case 16.—T. F., 67. Exploration: 1883, January 30. Tumour removed. (See Table, No. 6.)

Case 17.—W. R., 44. Symptoms severe. Hæmaturia during the last year and a half; no cause ascertainable.

Exploration: 1883, Feb. 2. Dr. George Johnson present. Nothing whatever found; tube retained four days. Wound healed readily, and in the following month he left free from symptoms. Sent to me by Dr. Appleyard, of Bradford. I have recently learned that there is some return of symptoms, although much less considerable than before the operation.

Case 18.—W. W., 63. Exploration: 1883, February 8. Tumour removed. (See Table, No. 7.)

Case 19.—J. M., 64. Exploration: 1883, Feb. 21. Tumour removed. (See Table, No. 8.)

Case 20.—Mrs. R., 65. Exploration: 1883, Feb. 27. Tumour removed. (See Table, No. 9.)

Case 21.—J. S., 53. Exploration: 1883, March 3. Tumour removed. (See Table, No. 10.)

Case 22.—J. F., 27. Very severe symptoms for four years without known cause.

Exploration: 1883, March 12. I found the upper part of bladder coated with thin phosphatic deposit; and detached a quantity which proved to be thin flocculent membrane with adhering phosphates, and was scraped off with my finger nail, when it became free in the bladder, and was removed with the forceps. I at first supposed it to be a slender villous growth. It was examined by Mr. Eve, who described it as above. Tube was retained one day; the wound did not heal; he had orchitis, and suffered much for a long time; ultimately there was some improvement.

Case 23.—R. B., 50. Severely painful and frequent micturition during last two and a half years; passes urine every hour, day and night; occasionally blood, worse for movements. No cause being discovered, exploration was made 1883, March 15, with his medical attendant, Mr. J. Hartley, Malton, Yorkshire. Nothing was found but roughness of the mucous membrane, not considerable in places. No fever, not much bleeding; tube taken out on third day, gradual improvement, left in the middle of April much relieved. June 1884. Continues to be troubled with undue frequency, and a little pain, but much less than formerly. Health good, and habits active.

Case 24.—C. L., 62. In 1880, October. Lithotripsy for small uric acid calculus, single sitting; a brief operation, without any difficulty, but followed by severe cystitis; becoming chronic, and attended with much phosphatic deposit; this condition continued in spite of treatment during 1881 and 1882, phosphatic concretions being occa-

sionally removed by lithotrite. In the beginning of 1883 the symptoms were more severe than ever; urine mucopurulent and bloody, and no cause ascertained.

Exploration: 1883, March 21, with Sir A. Clark. On the right side of the prostate a firm growth, size of a chestnut with broad base, protrudes into the bladder. Decided not to touch it, but drained the bladder for some days. In the middle of April the wound healed, and a little improvement, certainly not much, has been experienced since.

Case 25.—W. D., 65. Exploration: 1883, March 30. Tumour. (See Table, No. 11.)

Case 26.—J. C. D., 43. Pain, frequency and repeated attacks of hæmaturia, more or less during five years; symptoms now severe, without ascertainable cause.

Exploration: 1883, April 4. Dr. Stockton, of New York, present. Found nothing but very notable roughness at the top of the bladder, like phosphatic incrustation, but on attempting to remove it with finger nail, found it was an altered condition of mucous membrane, as if a congeries of varicose vessels with thickened walls; placed a tube in the wound. On the fifth day signs of pyæmia appeared, and he died on the 16th; no autopsy permitted.

Case 27.—C. C. S., 56. Exploration: 1883, May 4. Tumour removed. (See Table, No. 12.)

Case 28.—T. Q., 52. Exploration: 1883, May 9. Tumour removed. (See Table, No. 13.)

Case 29.—A. G. S. C., 57. Exploration: 1883, June 27. Tumour removed. (See Table, No. 14.)

Case 30.—H. B., 23. During last two years, subject to pain, frequency and slight hæmaturia, little influenced by treatment, and associated with other symptoms of an anomalous kind; much care was bestowed on the case, and no explanation of it was discovered.

Exploration: 1883, June 28, with Dr. Walker, of Lowestoft. Nothing whatever found; tube retained eight days. The wound healed, and he left in a month with less frequency of micturition, but with constant pain in the penis, and apparently little benefited by the operation.

Case 31.—R. W. C., 52. Had been cut for a large stone in May 1882 by Dr. Geo. Buchanan, of Glasgow. Wound healed rapidly. After this, great pain and frequency of micturition, not relieved by treatment.

1883, June 23. Passes water every twenty minutes, night and day; worse for movement; phosphatic deposits and blood in the urine; nothing discovered by sounding; empties his bladder perfectly. I thought it not unlikely that some calculus might be impacted or sacculated, and decided to explore.

Exploration: June 29; Dr. Walker, of Lowestoft, present. Nothing found. Retained tube eight days. He had much subsequent treatment for the bladder, and he left in about six weeks, retaining urine about an hour, instead of twenty minutes, a very slight improvement.

Case 32.—J. H. B., 40. Exploration 1883, July 7. Tumour removed. (See Table, No. 15.)

Case 33.—T. S., 42. Exploration 1883, November 16. Tumour removed. (See Table, No. 16.)

Case 34.—H. N., 68; October, 1882. Last four years much difficulty and pain in passing water; of late increasing. Now passes water about every hour, day and night. Catheter passed, forty ounces of retained urine; learned to use the catheter. Seen with Dr. Barker, of Finsbury Park.

1883, November, greatly relieved by catheterism for several months, but soon felt pain when the bladder was empty. Sounded; phosphatic calculus found, and removed at one sitting. Relief at first; subsequently increased pain and frequency; all urine passes by catheter. Decided to

explore the bladder, and did so December 11. Nothing was found, but the bladder very rugose, and the walls thickened by disease; it was drained for ten days, with relief. Wound soon healed, and he left on the 28th, not much benefited. Not long afterwards he died, worn out by suffering.

Case 35.—C. H. C., 25. In 1881, Feb., he first consulted me for attacks of hæmaturia, commencing two years ago after severe exercise. Blood appears chiefly at the end of micturition; always after exercise or standing. Nothing found by sounding: the symptoms strongly indicate tumour, although no débris is found after repeated examinations of the urine.

During 1883 lived chiefly on board his yacht, and then rarely saw blood; but this still appears freely after exertion.

1884, Jan. 23. Exploration of the bladder: Dr. Geo. Johnson and Mr. Bryant present. No tumour found; no organic change detected; retained tube nine days. There was no fever; health excellent; wound healed by February 6. In the middle of the month he began to walk, and did so for two hours a day during the third week, without any bleeding. May, 1884. He is now perfectly well; free from all symptoms.

Case 36.—Mrs. W., 44. 1884, Jan. For a year and a quarter micturition has been very frequent and painful, becoming worse of late. Has had much treatment, but the cause of her symptoms is obscure. Jan. 26, 1884. Explored the bladder, after dilating the urethra, with Dr. John Smith, of Dumfries, who brought the patient up. Found springing from the centre of the trigone a firm prominence, externally consisting of some soft structure, and almost polypoid in form, but on drawing it forwards in the attempt to ligature its base, this outer layer was first scratched through, when a hard calculus about the size of an acorn was disclosed and enucleated; the prominence disappearing.

She had long-continued fever with much exhaustion during almost a month; but gradually recovered, and returned completely relieved from her urinary troubles, and is now quite well; June, 1884.

Case 37.—H. F., 58. He first consulted me in 1879 for recurring hæmaturia, to which he had already been subject three years. I saw him from time to time, and, finding no clue to the cause, explored the bladder, 1884, Jan. 30. Mr. Henry Morris was present. Extremely good examples of villous growth had been found in the urine when examined under microscope.

At the operation no tumour was found, but numerous small papillæ were felt affecting the upper surface and sides of the bladder. These were dealt with by scraping with the finger nail, and by subsequent injections of caustic. He made a good recovery, and, on Feb. 20, the wound was quite healed; he was walking out; no frequency, pain, nor bleeding present. I have just seen him, June 5; he was walking four miles daily without any of his former symptoms.

Case 38.—B., aged 50. Exploration: 1884, Feb. 5. Tumour partially removed. (See Table, No. 17.)

Case 39.—W. G., aged 69. Exploration: 1884, Mar. 12. Tumour found. (See Table, No. 18.)

Case 40.—F. J. O., aged 58. Exploration: 1884, April 4. Tumour found. (See Table, No. 19.)

Case 41.—M. W. B., aged 45. Many years painful symptoms, and treatment for alleged stricture, which does not exist. During last twelve months great frequency of micturition: now, every half-hour, night and day. Instruments have been passed by himself and others up to the neck of the bladder, and then fail to enter. Examination shows that the neck of the bladder is distinctly tense, rigid on the lower aspect, but the short-beaked sound passes over it

readily into the bladder; nevertheless, there is no stricture, for No. 15 (English) will enter.

1884, April 14. Exploration. The finger on entering the bladder encountered rugæ and a roughened surface of mucous membrane, especially at upper part of bladder. The neck of the bladder was exceedingly tight, grasping the end of the finger like a ring; I divided this at the lower border so that the tension ceased. Free bleeding followed. A tube was tied in four or five days. He recovered slowly, and gradually regained power to retain his urine; the intervals being from two to three hours in the middle of May—a condition for which he was extremely grateful. He takes out-door exercise, and is in no degree worse for it.

Case 42.—R. S. R., aged 63. Exploration: 1884, May 30. Tumour found and removed. (See Table, No. 20.)

Case 43.—W. K. E., aged 66. Severe symptoms for some time; prostate very large and irregular. I found a phosphatic calculus, and removed it May 19, 1884, but very little relief followed, in spite of daily injections, and much treatment of various kinds. He requires frequent catheterism, but the intervals are very short, and his suffering increased during the first week in June, and I decided to explore the bladder, and did so on June 12. No fragments of calculus had been left, but I found prostatic out-growth forming a salient ridge, broad, and overlapping the base and sides of the internal meatus; tied in a tube, and exchanged it for a soft catheter next day. Great relief followed; he retained the tube eleven days, and after its withdrawal held his water two to three hours. June 28: he has not had such rest at night for several months, and the urine, which was highly offensive, and loaded with muco-pus, is now comparatively clear. July 10: he returns to the country almost well—better than I ever expected to see him. Sent to me by Dr. Sawyer, of Birmingham.

CHAPTER III.

TUMOURS OF THE BLADDER, THEIR PHYSICAL CHARACTERS AND INTIMATE STRUCTURE—SYMPTOMS AND SIGNS OF THEIR PRESENCE.

History of operations for vesical tumour in the male—Examples in the metropolitan museums—The author's cases—Intimate structure—Varieties—Symptoms—Physical signs—Examination of the urine.

THE literary history of vesical tumours is scanty ; and inasmuch as, with few exceptions, its earlier records treat the familiar outgrowths from the prostate, and the rarer neoplasms which arise from the bladder, without distinguishing between them, not much is available for our purpose.

More than one attempt has been made of late to collect all the cases which may be hunted up among old authors, with the laudable view of collecting information on a subject so lately fraught with new interest, but the result is not successful. The material which has thus been apparently gained as regards quantity by somewhat indiscriminately sweeping the dusty pages of old surgical writers, in the keen search for any semblance of a vesical tumour, is found

to possess little value, from the uncertain quality of the produce so gathered. The only object worth attaining by antiquarian research is the discovery of undoubted examples of true vesical growths, and of some important facts respecting them, and not the production of a list, the extent of which suggests erudition, but is due to a miscellaneous collection of records embracing mere prostatic outgrowths on the one hand, and cancerous formations on the other, indiscriminately mixed with all the varied products which lie between them.

Carefully eliminating obviously useless matter, I will give a brief historical epitome of the few unquestionable operations made for the purpose of removing recognised tumours of the bladder, with a view of showing what surgery has hitherto done in the way of removing them.

HISTORY.—There is no doubt that Covillard, of Lyons, performed the lateral operation for a vesical tumour proper, in the year 1639, having previously diagnosed, by sounding, the presence of ‘un corps dur et solide,’ not a stone. He describes how he crushed it with the forceps, destroying and removing it, and records that the patient recovered.¹

The occurrence of flocculent, sprouting growths, as well as of more solid growths from the neck

¹ *Le Chirurgien opérateur : avec des observ. iatrophirurgiques*, par Joseph Covillard. 8vo. Lyons, 1640.

of the bladder (prostatic) was well known to the older surgeons. Le Cat refers to them, and to some observations made respecting them by Ruysch, Houstet, Le Dran, and others.¹ In the end of the last century, Deschamps, Boyer, Guérin (père), and Desault, besides others, refer to vesical outgrowths, but Chopart offers the best description of them under the head of 'Fungus of the Bladder' in his classical work, and here vascular papilloma is distinctly described as differing from the malignant and other forms.² Furthermore, he relates the case in which Desault, towards the close of the last century, recognised a pedunculated growth of considerable size in the bladder of a patient, as he was cutting for the stone in Hôtel Dieu ; and relates that, after removing it, he twisted off the tumour with the lithotomy forceps, and that the patient made a good recovery.³ Then, very early in the present century, A. Petit, of Lyons, operating on a man aged 28, supposed to have the stone, found a large tumour, which, after consultation, was left untouched. The patient recovered from the operation, but returned to the hospital after a year to die, and at the autopsy the tumour was found to be of the size of a fist, and

¹ *Parallèle de la taille latérale*. Amsterdam, 1766, pp. 244-61.

² *Traité des maladies des voies urinaires*, par Chopart. A posthumous edition, edited by Félix Pascal. Paris, 1830 ; vol. ii. pp. 74-79. Chopart and Desault both died in 1795.

³ *Idem*, vol. ii. p. 97.

attached by a small pedicle which might have been easily divided.¹

The next definite record is by Civiale, who refers to three instances in which, subsequently to 1827, he removed small growths from the bladder evidently unimportant in size, with his original 'trilabe,' when crushing the stone, without any bad results. He also describes a similar operation on a fourth, much larger, the result of which was unsuccessful, and another case in Hôpital Necker, treated in the same manner, in 1834, with good result, adding that he has crushed other small ones with the lithotrite.² The nature of these operations necessarily precluded intelligent observation, or the acquisition of information respecting the growths themselves; and very little, if anything, is known of the ultimate history of the patients.

In 1834 Crosse, of Norwich, operated on a boy with severe symptoms of calculus, by the lateral operation, although on sounding he could find none, but several small tumours protruded from the wound, some of which he removed. The boy died in forty-eight hours, and a number of these growths was found in the bladder. The preparation is No. 2000 in the Hunterian Museum here.³

¹ *Dict. des Sciences Médicales*, vol. xlv. pp. 232-33. Paris, 1820. Article 'Polype,' by Vaidy.

² *Traité pratique*, vol. iii. pp. 152-61. Paris, 1860.

³ *Treatise on Calculus*, by J. G. Crosse, surgeon to the Norfolk and Norwich Hospital; plate xx. fig. 2, p. 124. London, 1835.

In 1874, Billroth, of Vienna, did the lateral operation on a boy of twelve to remove a tumour, a 'myosarcoma' of large size; finding the opening insufficient, he performed the suprapubic operation, and extracted it there. The boy made a good recovery.¹

In the same year Volkmann, of Halle, did the suprapubic operation for a man aged 54, removing a large myomatous growth, with a small pedicle only half an inch long, the patient dying of infiltration and peritonitis on the third day.²

Professor Kocher, of Berne, performed Nélaton's pre-rectal lithotomy, December 31, 1874, for a man aged 38, for the removal of a papilloma. The man was reported well one and a quarter year afterwards.³

At Addenbrooke's Hospital, Cambridge, Professor Murray Humphry did lateral lithotomy, October 17, 1877, for a man aged 21, removing a large tumour completely, the man recovering.⁴

Suprapubic lithotomy was done by Marcacci on a man aged 54 for vesical tumour in 1880. It was villous on the surface, but it was stated to be a 'spindle-celled sarcoma' throughout. He lived two months, dying of extravasation and peritonitis.⁵

Berkeley Hill performed lateral lithotomy at

¹ *Archiv für klinische Chirurgie*, band xviii., 1875.

² *Ibid*, band xix. p. 682, 1876.

³ *Centralblatt für Chirurgie*, April 1, 1876.

⁴ *Medico-Chirurg. Trans.*, vol. lxii. pp. 421-27. 1879.

⁵ *Lo Sperimentale*, Oct. 1880; *London Medical Record*, Dec. 1880.

University College Hospital in 1880, removing a portion of an epithelioma, in a man aged 63, who died two days after.¹

Davies Colley, of Guy's Hospital, performed lateral lithotomy in April 1880, for a man aged 32, drawing out a long villous growth, and cutting it off with a pair of scissors close to the wall of the bladder.² Mr. Colley has just written me (May 1, 1884) that the man is at this time perfectly well, and has followed his occupation—that of a shipwright—ever since.

The first case in which I myself removed a tumour by operation was that of a man aged 29, on whom I did the median operation, November 6, 1880. I found a polypoid growth and removed the whole of it with a pair of forceps, twisting it off at the base of the pedicle. He made a rapid recovery, and is living and well at the present time.³

My subsequent cases—19 in number, 17 in males, as well as 2 in females, all the former having been discovered by digital exploration of the bladder, and treated by the limited perineal incision employed for that purpose—will be furnished in a table to be considered presently.

Mr. Whitehead, of Manchester, has adopted this method of treatment, and employed it with consider-

¹ Report of Surgical Registrar, Mr. Stanley Boyd, 1880. London: Harrison, 1881, p. 33.

² *Clin. Soc. Trans.*, vol. xiv. p. 104. 1881.

³ *Trans. Med. Chir.*, vol. lxx. 1822.

able success. He has recently, in conjunction with Dr. Pollard, published six cases of operation for vesical tumour, four in the male, and two in the female. In two of the former a very favourable condition of the patient is reported nearly twelve months after operation, and the female cases, more recent, were well at the date of the report.¹

Certain other cases found recorded in the journals have been quoted by recent writers as examples of operation for vesical tumour, but are intentionally omitted here, since the operations in question have either failed entirely or partially to remove the tumour, or no such body has been present.²

It is also unnecessary to refer further to the history of operations for vesical growths in the female, since they have been long recognised as accessible to examination and amenable to surgical treatment without much difficulty. The well-known case by Surgeon Warner, of Guy's Hospital, in the former half of last century, occurred in a woman aged 24. He divided the neck of the bladder and

¹ *The Surgical Treatment of Tumours, &c.*, by W. Whitehead and Dr. B. Pollard (London : Churchill, 1883) ; containing much interesting matter, and valuable information on the subject.

² Thus Gersuny, Billroth's assistant at Vienna, performed the median operation in the winter of 1870-1, to remove a broken piece of catheter, and discovered a tumour, which could not be removed, and no attempt was therefore made. The patient died six days after, and the tumour was found at the autopsy in a recess at the back of the bladder. But clearly this is not an operation for tumour.—*Archiv für klinische Chirurgie*, band xiii. p. 131. 1871.

ligatured a large polypoid tumour with a successful result.¹

From the numerous well-known facts of a similar kind, and from the short list of operations on the male above recorded, it is quite certain that a considerable proportion of vesical tumours are removable, and that when completely or almost completely removed they often do not reappear. That is all which we gain from the study of the slender experience of the past, and, so far as it goes, it is not without value.

EXAMPLES IN MUSEUMS.—But there is another mode of studying the subject which has not been pursued to any great extent, and which nevertheless is fraught with greater promise; a mode, indeed, which it is only possible to pursue on an extensive scale in this country, since here only the requisite materials are to be found—I mean the study of the vesical tumours themselves, with their physical characters exposed to view, as found in the various museums of our metropolis, together with, in many instances, a few important facts relating to the character and history of those who were the subjects of the disease. It is among these important collections that we find the originals of those drawings which have served to familiarise the student, both here and abroad, with delineations of disease which they are rarely able to

¹ *Cases in Surgery*, by Joseph Warner, F.R.S., Surgeon to Guy's Hospital (London, 1750); and *Philosoph. Trans.*, vol. xlv.

see or dissect. Here are the very organs which were engraved for the works of Baillie, Hunter, Bell, Home, Crosse, and others and from which Civiale selected his subjects to illustrate the '*Traité pratique*' in connection with this topic.¹

Of growths or tumours arising from the inner surface of the bladder and pursuing an independent development within the cavity, there were in the metropolitan museums, prior to 1882, about fifty examples preserved in spirit.

Forty-three of these were from adults of various ages ; eight had occurred in young children. A large majority of the former or adult series had arisen in male patients ; but as in a few preparations the sex is uncertain, no exact statement can be made. Of the eight children, six were female. In addition to these fifty cases there is about an equal number of growths and infiltrations preserved in the same museums, which are probably cancerous, and respecting which there is little more to be said. Returning to the non-cancerous growths it may be stated that, in respect of physical conformation, a considerable proportion of them consist of a single growth from the walls of the bladder, more or less pedunculated ; and might obviously have been removed by operation without difficulty. Others are broad and sessile, developed into two or more lobes ; and much more

¹ *Traité pratique*, vol. iii. pp. 107 et seq., figs. 9-13. Paris, 1860.

rarely there are two or more independent growths in the same bladder. Then some are delicate, soft,



FIG. 4.—Two growths, probably fibro-papilloma. From preparation No. 2006, Royal College of Surgeons.



FIG. 5.—From a man aged 59. The tumour, which was of rapid growth, springs from a narrow base. As here seen, it fills the bladder, is chiefly solid, but covered with fimbriated papilloma. From prep. No. 2004, Museum, Royal College of Surgeons. A very similar preparation may be seen at University College Museum, No. 1475.

filamentous or fimbriated in structure ; while others are firm and solid ; much variety of density is to be



FIG. 6.—Firm polypoid growths, each with very narrow peduncle. Bladder everted to show them ; no papillæ present. From Museum of Guy's Hospital, No. 2104th.



FIG. 7.—Small, firm, almost polypoid growth.

met with among different specimens in the fresh state, as my own cases have led me to observe.

In relation to the question of situation, it does not appear that any part of the bladder can be regarded as a particularly favourite spot for their origin ; the orifices of the ureters, for example, as is stated by some. The lower half of the bladder is more frequently affected than the upper ; and I think that is the only distinct statement relating to locality which can be made.

I have selected several of the most typical varieties and have made drawings from them which have been engraved in order to illustrate the subject of size, contour, and number, so important in relation to questions of surgical treatment, hereafter to be considered (see figs. 4, 5, 6, 7 ; also 1, 9, and 10).

THE AUTHOR'S CASES.—Next to the preserved examples may be considered the result of my own experience, derived from exploring the bladder, in the manner described in the preceding chapter. By means of this operation I have already encountered no less than twenty cases of vesical tumour. At the end of the volume will be found an account of them in a tabular form, which shows at a glance the following particulars : the age of the patient, the date of operation, the duration of symptoms up to that period, what was the earliest symptom observed, the result of examination of the urine before operation, the nature of the operation itself, the form and situation of the tumour, its structural elements after

examination, and the after results to the present time.

In some cases I have, as far as the sense of touch has enabled me to judge, removed the entire growth, and when unable to do so have taken away as much of it as possible; pruning, so to speak, the most salient portions, when the growth was inseparable from the walls of the bladder, a condition met with in several cases. In all instances, however, I have been very careful to examine the growth so minutely with the finger before operating, as to be able to offer a diagrammatic representation of its size and form. In each one of these cases I made a sketch at the time, representing to the best of my ability the impression thus obtained of the contour and situation of the growth in relation to the vesical cavity. These are reproduced here in order to illustrate each case when referred to; and thus fresh information in regard of the conditions likely to be met with in such cases has been obtained. I think in general terms it may be affirmed that a single tumour attached by a narrow pedicle to the wall of the bladder, and therefore resembling more or less the outline of a fig, is not very common, and to say that it may occur once in six or seven cases of non-malignant tumour probably approaches a correct numerical estimate. On the other hand, sessile growths, of which the base is perhaps the widest

part, are met with, perhaps quite as frequently as the pedunculated form just described: and then there are intermediate forms of every grade between the two; the preponderance in number perhaps being among the non-pedunculated class.

STRUCTURE.—We now come to structural characters. Hitherto most of the statements relative to vesical growths have been somewhat vague, since materials for observation have not been attainable. Thus it has been customary to regard 'villous' growths as a class; and these were at no very remote period termed 'villous cancer.' The existence of papilloma has been generally recognised; occasionally sarcomatous growths have been spoken of, although probably without intention to convey the meaning which modern pathology attaches to the term. After that, follow epithelioma and cancer. Then occasionally, but rarely, an isolated specimen has appeared at the Pathological Society of London, and has been subjected to a minute examination, but the total of these specimens has not afforded data for making any classification. Neither at present is it possible to form a complete generalisation, but valuable indications have been attained from the twenty cases now brought before you, which indicate a sufficient number of important facts to commence with. Every one of the tumours I have dealt with, including the few which have not been removed (since I have invariably taken

away a portion sufficiently large for complete histological examination), has been carefully treated by a competent observer, at first by Mr. Stanley Boyd, with one or two by Mr. Eve, and others by Mr. Shattock, while all the later ones (fourteen in number) have been laboriously investigated for me by Dr. Heneage Gibbes, from whom I have received in every instance a full written report on intimate structure and several microscopic preparations, some of which furnished the originals of some very accurate and beautiful drawings, made and engraved by Mr. T. P. Collings, and presented here.

After a survey of the museum specimens on the one hand, and a consideration of the facts determined by histological analysis of my own cases on the other, with Dr. Heneage Gibbes, I have made the following attempt at classifying these products, and I think it will be regarded as warranted by the evidence.

First, there is the simple mucous polypus which I have at present only found in the bladder of children, and in their cases only among the preparations in the museums referred to—some of which appear to be analogous in structure to the soft nasal polypus, a form of myxoma, while other specimens appear to contain, in addition, more of the deeper normal fibres of the structures from which the growth arises. In the specimens referred to, of which one was engraved

in Crosse's work, and another is presented here (fig. 8); the growths are numerous, evidently rapidly



FIG. 8.—Polypoid growths (myxoma), from a child $1\frac{1}{2}$ year old, under Mr. Marshall at University College Hospital. From Museum, No. 1471 E.

formed, soon fill the bladder, and in the case of female children sometimes issue by the external meatus, and present in the vagina.¹

The operators have described the first-named

¹ One example of polypoid growths in a child is given in Dr. M. Baillie's series of engravings illustrating the morbid anatomy of the human body, &c. (London, 1799, fasc. vii. vol. iv. fig. 2, p. 151). This is now Prep. No. 1999 R.C.S. Museum. Crosse's example is shown at pl. xx. fig. 2 of the *Treatise on Calculus* (London, 1835), and is Prep. No. 2000 in the same museum. Three other specimens are in Guy's Hospital Museum: one, a girl aged five years—No. 2104³⁰—described by Mr. Birkett in *Trans. Med. Chir. Soc.*, vol. xli. p. 311; another, 2104³²; and a boy, No. 2104³⁴.

One is in St. Bartholomew's Museum, 2419, described in *Path. Soc. Trans.*, vol. iii. p. 127; one in St. Thomas's, B B 28; and one in University College, 1471 E, carefully described in *Path. Trans.*, vol. xxxiv. pp. 150-1—by Mr. S. G. Shattock. An interesting case is reported by Mr. Howard Marsh in the *Path. Soc. Trans.*, vol. xxv. pp. 178-80, carefully examined by Mr. Butlin and by Mr. M. Beck.

kind when fresh as soft, gelatinous, and translucent ; conditions which are lost in the preparation by immersion in spirit.

In all but one of the eight cases in the museums the age was two years or less, and in the exception was five years only. It is not unlikely that some of these may be congenital, while the structure shows them to be composed of embryonic elements. I have never met with anything of this kind in the adult bladder.

Two of the more recent specimens have been carefully examined and reported on at the Pathological Society, and are referred to in the note below, forming in fact the two specimens last on the list there given. One, examined by Mr. Butlin and Mr. Beck, was 'found to be composed almost entirely of small round cells of a lymphoid type embedded in a basis, homogeneous or nearly so on the surface, but becoming more and more fibrous towards the pedicle, until at the base the fibrous tissue forms the bulk of the growth, the cells being only scattered here and there, either singly or in groups.' The other, examined by Mr. Shattock, is described as displaying 'oval and more elongated cells lying in an abundant intercellular substance, either albuminous or mucous, and scantily traversed by fibres ; no stellate cells are present.'

In regard to the cases of vesical tumour in which

I have myself operated, they fall naturally, as do those of other regions, into two distinct categories : namely, those which consist only of elements identical with the normal tissues of the bladder, 'homœoplastic' ; and those which consist, more or less, of other elements never found in the tissues of the healthy bladder, or 'heteroplastic.'

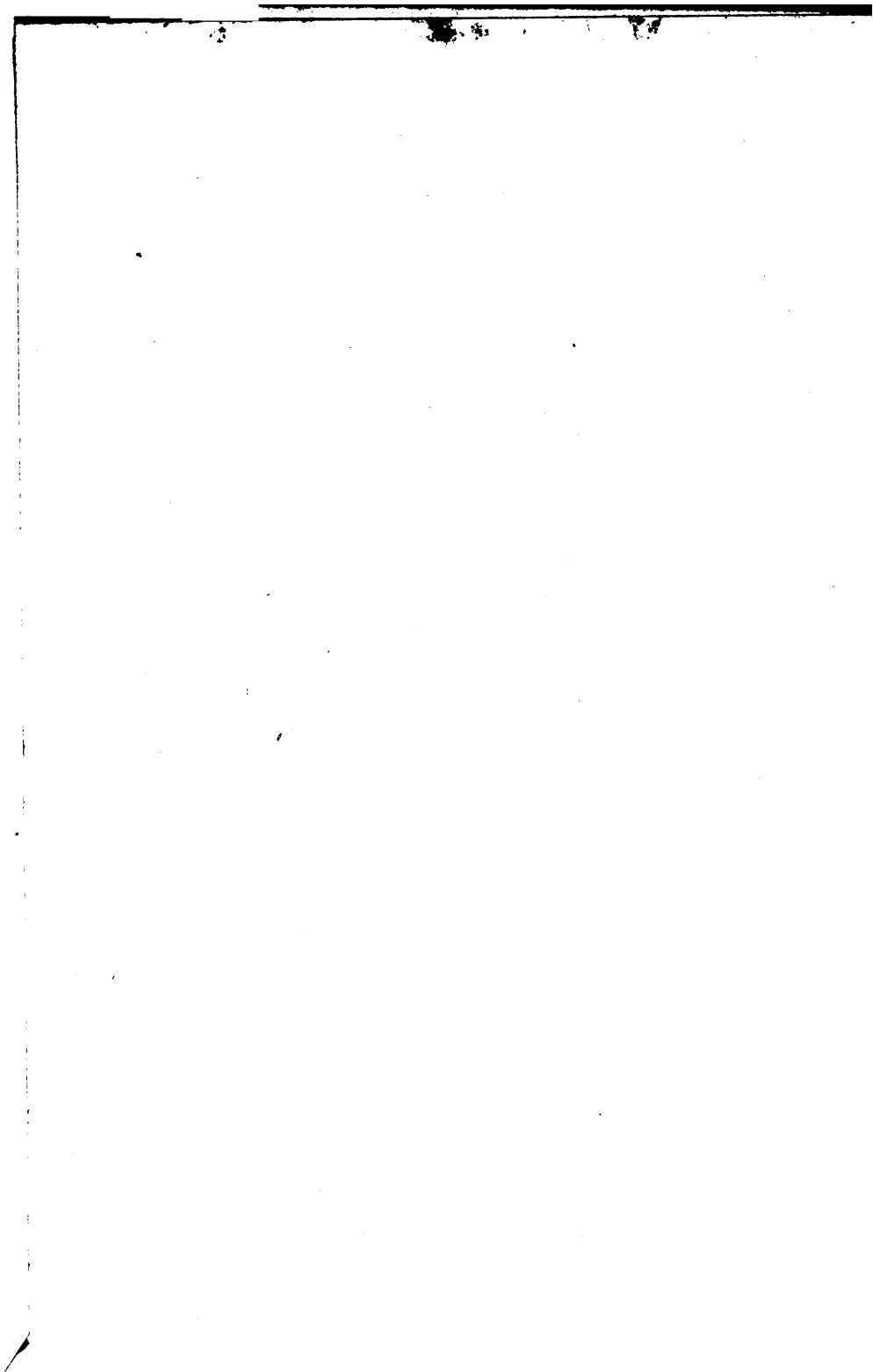
The first category offers at least three forms of growth, but passing insensibly from one to the other, being apparently diverse developments of the same structural change. Two of them may be spoken of as papilloma, which appears in two typical forms. Before describing them I shall give a representation of healthy vesical mucous membrane for the purpose of comparing the epithelium and its underlying tissues in the bladder with the analogous tissues in papilloma. It is a drawing from a very successful section made immediately after death from the emptied bladder of an ape by Dr. Gibbes (Plate I.). It shows a minute fold of the mucous membrane, resulting from that duplicature of it which takes place when the bladder is contracted. And thus it has, in this temporary condition, a strong resemblance to the permanent form which a single papilla exhibits when papillomatous growth is present in the bladder.

1. *Fimbriated Papilloma*.—I employ this term to designate that product which has been familiarly known as the 'villous' growth, which is admitted

PLATE I.



SECTION OF HEALTHY MUCCOUS MEMBRANE, MADE DIRECTLY AFTER DEATH,
FROM THE APE: SHOWING NATURAL FOLDING OF THE MEMBRANE IN THE
EMPTYED CONDITION OF THE BLADDER, AND THE RESEMBLANCE THE FOLD
BEARS TO A PAPILLA: $\times 160$.



to be objectionable on several grounds. The most obvious character of the growth is a structure in which the vesical mucous membrane is developed into fine papillæ, which consist of long fimbriated processes of extreme tenuity, and usually form a group arising from a small circumscribed base. This last-named part contains other and more solid structure than that which enters into the papillæ themselves. Sometimes the processes are almost single thread-like forms, arranged side by side, and undivided for a considerable distance; others are bifid, generally more compound still; some may be described as digitate, and occasionally the processes radiate and suggest forms resembling those of leaves. Immersed in fluid, the long fimbriated growths float out like slender-leaved aquatic plants in deep water; and when removed to air, collapse and form a soft mass resembling a small strawberry. Usually one only is found in a bladder; sometimes there are two or three, and sometimes minute growths of the same kind may be found affecting, more or less, the lining membrane of the cavity (see figs. 9 and 10; also fig. 1 at p. 11). The microscopic structure, which has been often well described,¹ may be given

¹ Examples of these have been presented to the Pathological Society of London by several observers; among them by myself as early as 1856. *Vide* vol. v. p. 200, and vol. vi. pp. 213-4, both relating to the same case. Another, vol. vii. pp. 256-7. Also vol. viii. pp. 262-4; vol. xi. pp. 153-5; vol. xviii. pp. 176-8; vol. xxi. pp. 239-44 and 265-6; vol. xxxiii. p. 220; vol. xxxiv. pp. 157-60.



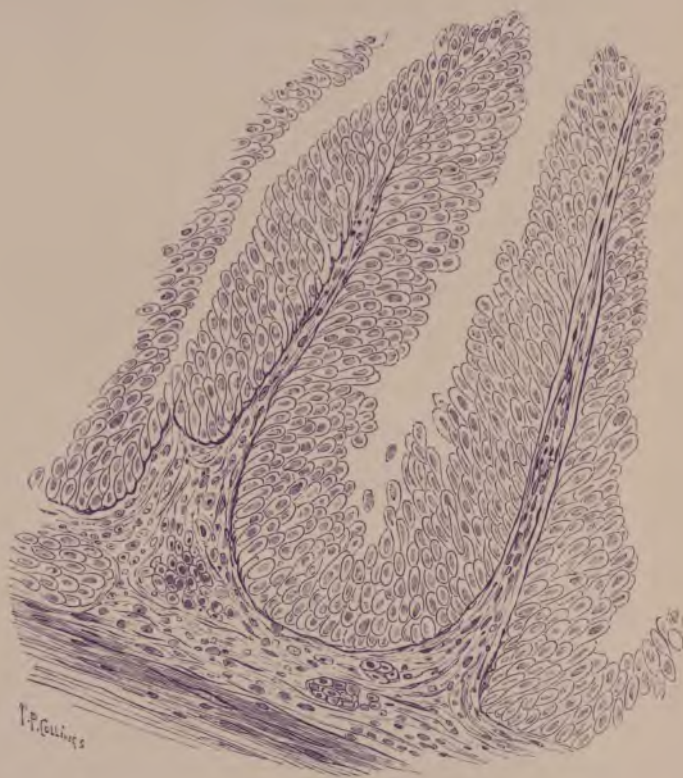
FIG. 9.—Fimbriated papilloma ('villous'), arising from a single peduncle. From Museum of University College, No. 1471 A.



FIG. 10.—Fimbriated papilloma ('villous'). From Museum of Royal College of Surgeons, No. 2005.

briefly as follows: 'Each of these delicate papillæ or "villi" consists of a connective-tissue ground-

PLATE II.



FIMBRIATED PAPILOMA, SHOWING TWO OF THE SLENDER PAPILOMATOUS
PROCESSES OR, SO CALLED, 'VILLI': $\times 160$ (FROM CASE 15 OF THE TABLE.)

work, covered by layers of columnar cells, resting on a fine basilar membrane, and exactly resembling those of the normal bladder. In the deeper part there are bands of non-striped muscle. These bands do not run into the papillæ, only two or three isolated fibres enter their bases. The growth is well supplied with blood-vessels; capillaries running up and into the villi, and branching directly under the basement membrane. They are large, and have very delicate walls.' (Dr. H. Gibbes.) The case of T. H. B., aged 40, case No. 15, is the best example of this in the series: see Plate II., in which drawing, as in those which follow, the structures have been faithfully and very admirably represented.

2. *Fibro-Papilloma*.—I prefer this term to that of 'Ordinary papilloma' as first suggested, because it more correctly indicates the difference between the structure now in question and that described as 'fimbriated.' Thus in 'fibro-papilloma,' the papillary processes, although present in more or less abundance, do not constitute the chief part of the structure, which is accordingly more solid, consisting of the constituents, unstriped muscle, and connective-tissue fibres of the submucous tissues of the vesical coats. The papillæ are sometimes shorter, less developed than the 'fimbriated' processes of the previous division. The microscopical report of the solid part or groundwork

of the tumour in a typical case is as follows : ' Here there is a distinct outgrowth from the wall of the bladder, of trabeculæ composed for the most part of non-striped muscle-tissue. From these trabeculæ arise secondary trabeculæ, into which the non-striped muscle-tissue is continued in varying amount, according to their size. The growth is covered with layers of columnar epithelial cells, exactly similar to those of the normal bladder.' Of this class the case of Dr. MacC., No. 4, is one of the best examples. See Plates III and IV.

It may be remarked here that the mere presence of papillæ on a tumour, whether met with in the simple form which has been just referred to, or when assuming the long fimbriated form previously described, does not serve in any way to identify or characterise a growth, since such papillæ may be met with springing from the surface of heteroplastic growths, as epithelioma and cancer.

3. *Tumours of a Transitional Type.*—The third type above referred to, although related with the preceding, inasmuch as the basic structures are still homologous with those of the bladder, appears to be best indicated by using the term 'transitional' to describe it, as perhaps occupying a place between papilloma and a formation of malignant type, sarcoma. Thus there is not only a peculiarity in the arrangement of the basic fibres, but the presence of

PLATE III.



FIBRO-PAPILLOMA: UNDER A LOW POWER ($\times 80$) TO SHOW GENERAL ARRANGEMENT OF STRUCTURE. (FROM CASE NO. 4 OF THE TABLE.)

PLATE IV.



FIBRO-PAPILLOMA: UNDER HIGH POWER ($\times 340$) SHOWING A CAPILLARY VESSEL AND A FEW NON-STRIATED MUSCLE-FIBRES. (FROM CASE NO. 4 OF THE TABLE.)

PLATE IV.



FIBRO-PAPILLOMA: UNDER HIGH POWER ($\times 340$) SHOWING A CAPILLARY VESSEL AND A FEW NON-STRIPED MUSCLE-FIBRES. (FROM CASE NO. 4 OF THE TABLE.)

PLATE V.



EXAMPLE OF THE 'TRANSITIONAL' TYPE OF TUMOUR: SHOWING THE GROUND-SUBSTANCE INFILTRATED WITH VARIOUSLY-SHAPED CELLS; AND NUMEROUS BLOOD-VESSELS RUNNING TO THE SURFACE: ONE HAS GIVEN WAY, AND EFFUSED BLOOD IS WELL SHOWN AT THE HIGHEST POINT: $\times 160$. (FROM CASE NO. 12 OF THE TABLE.)

certain cells foreign to the structure itself is observed—a fact of importance.

Dr. Heneage Gibbes describes these tumours as ‘characterised by a dense fibrous groundwork of very irregular growth ; and by the presence in this groundwork of variously shaped cells, generally arranged in definite groups. In some they are small round cells, in others large irregularly shaped cells with nuclei. In some of these tumours there are in parts short, thick papillæ : in other places there are no papillæ, but in all cases the surface is covered by columnar epithelial cells, resembling those of the normal bladder. The one feature which differentiates them from the two preceding forms is the arrangement of the ground substance, and the presence in it of the irregularly shaped cells, which do not belong to normal tissue on the one hand, or to distinct new growth on the other.’ These characters excite suspicion as to the issue of the growth. The cases of C. C. S., No. 12, and T. S., No. 16, are examples of this group : see Plate V., which is faithfully drawn from Case 12.

The second category of growths, the characteristic of which is heteroplastic structure, is illustrated in the bladder by epithelioma, and perhaps, but if so, certainly in rare instances, by the sarcomata : between which latter and the papillomata a relation has been suggested in the last-noticed growth of the previous

category, through the presence of certain cells above described.

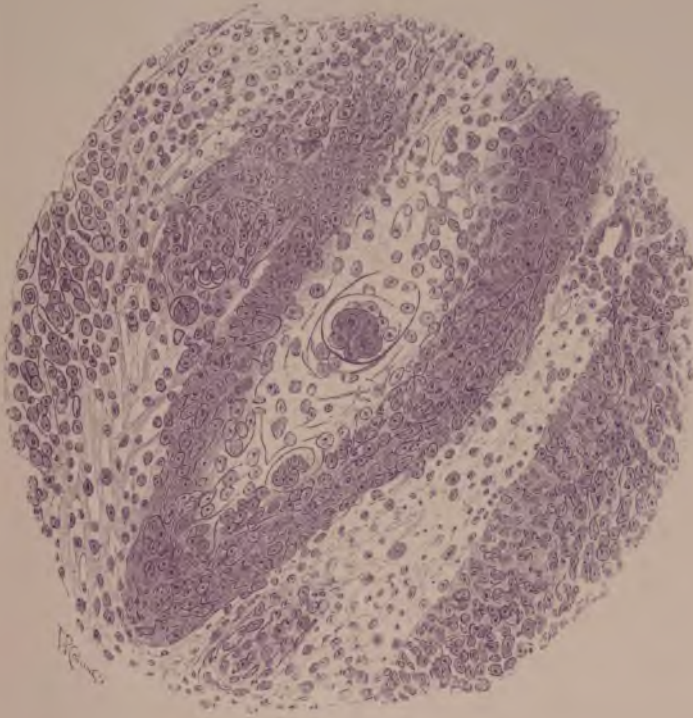
One example of epithelioma was met with in my series, namely Case 6. It will be unnecessary to enter on any description of this familiar product, but a microscopic section of that tumour is seen, Plate VI. The existence of true sarcoma of the bladder has been affirmed,¹ but not on the observation of fresh specimens. The presence of leucocytes, or of other cells, both round and spindle-shaped, liable to be found in abundance after inflammatory action in the growth, or as seen in the transitional form described, has perhaps led some observers to pronounce such structures to be sarcoma. Before long it is not improbable that some unquestionable example will be met with and identified.

Scirrhus undoubtedly occurs as a deposit in the walls of the bladder, and usually affects the base and sides sufficiently to admit of identification by rectal examination. The hard, unyielding, irregular, knotty outline presented there to the finger is so characteristic as to make its presence easily recognised.

Cancer of an encephaloid type is sometimes met with, but it is difficult at present to say how often it affects the adult bladder ; it is probably not common in that situation. It is interesting to observe that there is one preserved example of melanotic growth,

¹ *Path. Trans.*, vol. xxxiv. p. 157.

PLATE VI.



EPITHELIOMA : SHOWING INGROWTH OF EPITHELIUM AND A 'NEST' IN THE CENTRE
OF THE SECTION : $\times 160$. (FROM CASE NO. 6 OF THE TABLE.)

a very small one, affecting the bladder. It is in the Museum of Guy's Hospital, and was found at the autopsy of a man aged thirty-two, who had been a patient with melanotic disease of the eyeball, and with similar deposits in various other parts of the body. It is represented at fig. 11.



FIG. 11.—Small melanotic tumour of the bladder. Guy's Museum, No. 2104²⁰.

Finally, that rare product, dermoid tumour, is occasionally found in the bladder. The contents of dermoid cysts, it is well known, are sometimes expelled, probably from an ovarian source, through the urinary passages. But in one case, which occurred in the practice of my friend Mr. T. Bryant, and which I had the pleasure of seeing with him, the locality of a dermoid tumour was undoubtedly vesical. It occurred in a married lady, aged 30, whose first symptoms were those of cystitis, with the appearance in the urine of long hairs coated with phosphates, considerable quantities of which were from time to

time removed from the bladder. Subsequently digital exploration was made, a pedunculated tumour discovered, and completely removed in two operations. It was composed of a thick layer of true skin, with much fibrous matter, interspersed with sebaceous glands and hair follicles. Altogether it much resembled in form and size an ordinary, rather large button mushroom. The patient is now absolutely free from all symptoms. I am indebted to Mr. Bryant for the accompanying drawings illustrating the nature of this formation (figs. 12 and 13).

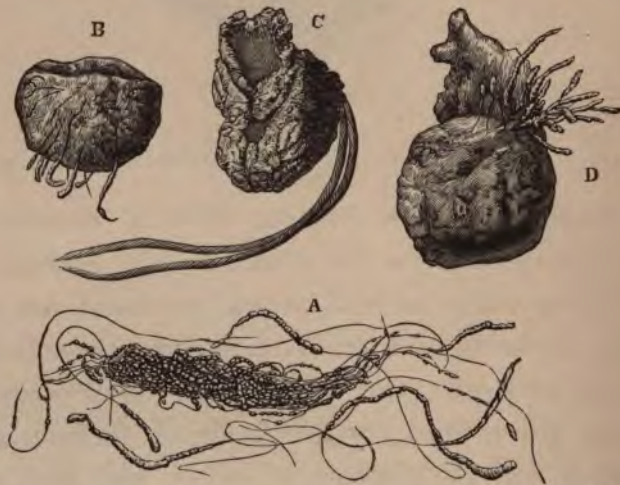


FIG. 12.—Dermoid growth removed from the bladder, with hairs (A) covered with phosphatic concretion. B. First part removed. C. Pedicle with ligature. D, Growth and pedicle finally removed.

It may be now fairly inferred that the commonest species of tumour affecting the adult bladder are

papilloma, occurring in two forms—the fimbriated in tufts of elongated papillæ, and the fibro-papilloma,

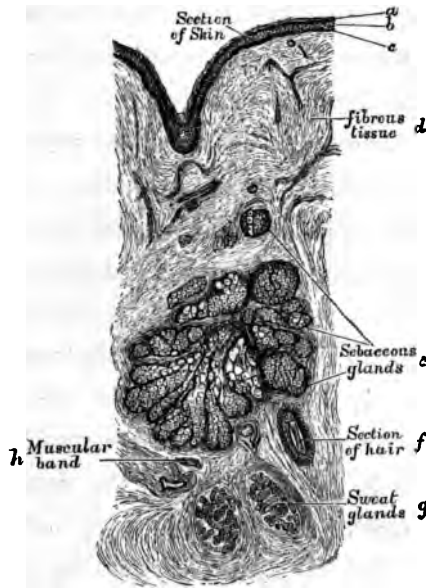


FIG. 13.—Microscopical appearance of a section of the skin covering the dermoid tumour.

more solid, largely composed of the ordinary sub-mucous tissues forming the vesical coats—all homœoplastic in character. A third product, more or less resembling the latter in its fibrous constituents, but exhibiting the presence of cells, doubtful in character, sometimes perhaps due merely to inflammatory action, while it excites suspicion as to its tendency, cannot be altogether removed from the homœoplastic group, and, as before said, is provisionally termed 'transitional.' The papillomata have certainly no malignant

tendencies, but their disposition to increase and fill the cavity of the bladder, and thus to disintegrate at their periphery, together with their vascularity and consequent strong disposition to bleed largely, render them sooner or later invariably fatal.

About ten or eleven cases of my own series are certainly papillomatous. Collating the accounts given, and the phenomena manifested by these patients, the general symptoms may be described as follows :—

SYMPTOMS.—The earliest symptom is mostly hæmorrhage. It is observed before unduly frequent micturition is complained of and before it is painful. On the other hand, in most of the cases in which the tumour was of the malignant type or approached thereto, pain and frequency of passing water generally preceded the appearance of blood, sometimes for a considerable period of time. In almost all cases symptoms had been noted during at least three years before the patient applied to me ; in some as much as six or seven years. When the growth consists chiefly of delicate filiform papillæ, the bleeding is more continuous and free than in ‘fibro-papilloma,’ or in the ‘transitional’ forms, where the structure is more solid, and where the fimbriated processes may be altogether absent, or but little developed. There appears to be nothing particularly characteristic in the nature of the hæmorrhage, excepting the one

important circumstance, always to be inquired for, and which ought, if possible, to be observed by the surgeon himself; namely, that in the act of micturition the stream may sometimes commence without any blood stain, or with only a slight admixture, and end of a bright red colour from the presence of much fresh blood. With such an occurrence, and no recent urethral lesion having been made, the source of hæmorrhage must always be vesical. Supposing in such circumstances that the absence of stricture, ordinary diseases of the prostate, calculus of the bladder, and cancer, have been ascertained by sounding and by rectal examination, it remains only to observe certain products which the urine itself may contain.

PHYSICAL SIGNS.—I should first say, that little positive evidence is obtained by the rectal and vesical examinations just referred to, in relation to any other growth than the hard, cancerous deposits, which are usually easy enough to identify. The result is generally negative, or nearly so, when a growth of the papillomatous or of the allied variety is present. The only positive physical sign thus attainable which I have met with, and this in a few cases only, has been the sense of slight obstruction to the free movement of the sound on one or the other side of the bladder, in others merely 'a soft feel,' as I have termed it in my notes, as if one were moving the sound in a thicker medium than urine, and without so defined a —

limit as is presented by the healthy vesical walls. Then, when examining by rectum, a soft rounded fulness is sometimes to be felt when the finger can be passed beyond the prostate to the base of the bladder, but nothing that is in the least degree definite or distinct.

I have made a practice of fully examining the bladder with a sound, and the rectum by means of the finger while the patient is under the influence of ether on the operating table, prior to performing digital exploration ; nevertheless, such are the conclusions I am compelled to come to in relation to sounding for tumour.

EXAMINATION OF THE URINE.—~~This process~~ This process is highly important, and is often very significant. Its object is to obtain disintegrated portions of the tumour if present, and to identify their structure under the microscope. It may be necessary to examine several specimens in order to obtain indubitable evidence on this point. An excellent way of obtaining such specimens is to wash out the bladder freely with warm water. It rarely happens that this process fails to detach fragments sufficient for our purpose if there is a fimbriated growth in the interior. But I have recently adopted, after failure by simple washing, the use of an evacuating catheter of small size, connected with the aspirator employed in lithotrity, and by this means have easily obtained specimens which were

complete evidence of the presence of a growth. This occurred in my last case, No. 20.

There is still another method which, when a fimbriated growth is present, will secure a specimen, and will, moreover, sometimes identify the presence of a salient tumour. It consists in carefully exploring the bladder with a small flat-bladed lithotrite. I discovered my first tumour thus; it was coated with phosphates, and I thought it might be a partially sacculated calculus, as I could seize but could not move it. I have been able to detach small portions of a growth thus, a little hæmorrhage necessarily resulting.

Supposing, however, that some fragments have been washed out, these should be placed under a $\frac{1}{4}$ -inch object-glass, when the following elements may be sought. First, a portion of a slender papilla, or so-called 'villus,' sufficiently complete for identification, may be met with; the arrangement of columnar epithelium, at right angles to a central axis, and radiating round the terminal point, and presenting a structure which is unquestionable proof of the existence of such a growth in the bladder. On two occasions I have decided to operate on the strength of this evidence.

Secondly, the appearance to the naked eye of small, slightly translucent, semigelatinous fragments in the urine are, of course, very significant. Under the power

named, these mostly appear to be made up of spindle-shaped nucleated cells, some comparatively short and broad, others elongated, and some nearly acquiring the character of a short fibre. These fragments have been present in several cases in which tumour has been subsequently found ; a fact which, in each instance, is noted in the Table of Cases. In two or three instances I have examined the urine day after day, and found no characteristic structure, but this was before I sought, as I now invariably do, by purposely washing out the bladder. In one or two others I have found great numbers of cells like young pavement epithelium, but these are not sufficiently characteristic to offer any indication available for diagnosis.

CHAPTER IV.

OPERATIONS FOR THE REMOVAL OF TUMOUR AND
THEIR RESULTS—CASES AND TABLE.

Treatment—Styptics—Injections—Operation for their removal—
Results—Cases.

TREATMENT.—Supposing we have arrived at the conclusion that the bleeding is certainly vesical, and that in all probability it arises from the presence of an intravesical growth respecting which there is no evidence that it is cancerous in its nature :—are there any means to be employed for checking the growth, or even for destroying it, without having recourse to a surgical operation involving the use of the knife? Are there any means by which hæmorrhage may be subdued or restrained in cases considered temporarily unfit for operation through exhaustion, &c., or for cases in which operation is only partially successful in removing the tumour, and a portion is inevitably left behind ; or for those cases of malignant tumour which are not amenable to any attempt to remove them, and are therefore only susceptible of palliative treatment?

I would reply that, in my experience, I do not know one of the so-called internal styptic remedies

which is of any service in vesical hæmorrhage from any form of tumour. It is exceedingly difficult to prove a favourable result on the trial of any one of these agents. An attack of vesical hæmorrhage naturally runs a short course provided the patient ceases his usual active habits. It is in connection with this influential treatment—viz. rest and the recumbent position—that styptics are given; and when the hæmorrhage stops, as it has a natural tendency to do, the drug swallowed at the time obtains the credit of a power which almost certainly does not belong to it.

I have much more confidence in astringent injections thrown into the bladder with great gentleness, and through a small soft catheter. The two which I have used, and with some frequency, for cases in which operation is not at present decided on, and especially for those in which the tumour has been only partially removed, are perchloride of iron and nitrate of silver. These latter cases have been far more improved after incomplete operative procedure than I could have anticipated, and their recurring hæmorrhages have been readily controlled by these agents, the iron being, perhaps—certainly in two of these cases—more efficient than the other. The strength employed has been from 20 to 60 minims of the tincture of the perchloride of iron in 4 ounces of cold water; to be used daily once or twice, accord-

ing to circumstances. Of the nitrate of silver, from gr. i. to gr. vi. in 4 ounces of water ; the stronger solutions being rarely tolerated or necessary.

In regard of malignant disease above alluded to, I may in this place briefly but emphatically state that if the physical characters and symptoms, especially the former, indicate the presence of a growth of this nature, any operative proceedings for its removal must be not merely futile and imperfect, but extremely dangerous, and ought not to be undertaken. It does not follow, however, that in such cases the draining of the bladder by a perineal opening may not, in certain circumstances, be a useful proceeding to relieve suffering or prolong life, &c.

Lastly, I do not propose to do more than name here the great importance of careful attention to the digestion and state of the bowels, in all cases of hæmorrhage from intrapelvic sources, but shall return at once to consider the only means of affording permanent relief to the subject of vesical tumour, namely, the operation for its removal.

OPERATION.—We now suppose that digital exploration has been made by external urethrotomy, and that the steps of the proceeding have been followed, as described in the second chapter, and further, that the operator, on introducing his left index finger, at once encountered a growth of some kind. He should first deliberately spend some two,

three, or four minutes, if necessary, in ascertaining its size, situation, and general outline.

Pressing the abdomen firmly with his right hand into the pelvic basin, he soon ascertains whether the tumour be attached to the wall of the bladder by a narrowish pedicle, or whether it is rather an outgrowth which springs from a considerable area of the coats, and is inseparable from them. He traces the surface, which may be broadly mamillated, one or many lobed, or simply polypoid, firm in contour, or soft and fleecy. Lastly he observes whether the whole is dense, compact, and immovable, or soft, more or less floating, and perhaps fragile. It is important to have a distinct idea of the situation of the tumour, as to whether it lies more to the operator's right or left, which is at once apparent in most instances; then, whether it belongs more to the side or to the floor of the bladder, or whether it springs from the opposite surface farthest from the meatus, or from the upper aspect of the cavity. The mind soon forms a distinct image of the body to be dealt with, and simultaneously arrives at a judgment as to whether it be possible to remove it entirely or partially, and if the latter, whether a sufficient portion can be safely taken away to warrant further surgical interference. If the tumour be polypoid in form, with a distinct pedicle, narrow, or even wide, there can be no doubt as to the propriety of operating.

But if the growth admits of considerable portions being removed without injuring the substance of the vesical coats, which should be approached with great caution, then, also, my opinion is that such portions should be attacked, under the conditions hereafter to be named. When, on the other hand, the substance is hard, and exhibits no marked prominence of contour, characters usually found to be associated, no such attempt should be made ; a small portion may be easily removed for microscopic examination, and that should be done.

But now comes an important consideration which should be carefully disposed of before any interference with the tumour takes place from the perineal opening.

When the survey of the vesical cavity has been completed, the operator has to determine the following question : Am I capable of completing my design of removing the tumour before me wholly or partially, as the case may be, through the incision made, or should I do so more efficiently through a supra-pubic opening ? For it may be taken for granted that a case may occasionally present itself in which the latter course may appear to be preferable, and if so there is no reason whatever for not selecting it. The perineal incision made will not add to the risks of the case, and it has afforded that most important element, the means of obtaining an exact diagnosis.

Now I may here say that my proposal to remove vesical tumours by perineal urethrotomy has met with a direct challenge in Paris from my friend Professor Guyon and his school, who say that the suprapubic operation should be invariably employed for the purpose, and the perineal operation never. I cannot refrain from suggesting that the emphasis with which this doctrine is just now enunciated by some, would be more authoritative had the writers ever tested the method I have now so often practised. There can, I suppose, be no hesitation in anyone's mind that the high operation is a much more formidable and hazardous proceeding than the simple boutonnière. Why, then, should the former be practised in any case until absolute certainty is attained, not only that tumour is present, but also that it is removable by operation? No doubt that in a considerable proportion of suspected cases, the presence of tumour may be regarded as strongly probable; but in very few can it be stated with certainty until the finger has entered the bladder. In no single case can the surgeon ascertain whether or no the tumour in question is separable from the bladder until the cavity has been opened and the physical conditions examined. Well, all these facts—first, the fact of the presence of tumour; secondly, its form and size; thirdly, the nature of its connections with the vesical structures—all the data necessary

for determining the question of operation can be attained by a slight urethral incision which involves no risk. What imprudence, then, can be greater than that of performing the high operation with all its admitted risks while the operator does not know for certain that a tumour is present ; and while he knows that if he does find one the numerical chances are even that the tumour, although thus completely approached and laid bare, cannot be entirely removed without inflicting fatal injury on the patient ; since one-half the cases are not completely removable.

Further, I declare that while the boutonnière enables the surgeon to ascertain all the facts which it is so necessary to obtain before operating, it also enables him to remove the tumour without difficulty, when it is polypoid in form, and therefore capable of being removed with a fair amount of ease and safety. If however he believes—and he is then in a position to determine the question—that he can attain a better result in any particular case by the high operation, there is nothing whatever to prevent his performing it. In one, or at most two, of my twenty cases, in two of the early ones perhaps I might have so operated with advantage. I should probably do so now on again encountering similar conditions, but in all the remaining cases the risk to the patient would have been greatly increased by performing the high operation, and I should have acquired no facility for

removing his tumour beyond that which external urethrotomy afforded me. On the other hand, when a tumour is discovered which it is impossible to remove, I have the satisfaction of knowing that, at all events, nothing has been done to endanger the patient's life by the simple operation which has been performed.

We shall now consider the means which it is desirable to employ in order to remove the tumour, when, having examined it fully, we have decided to make an attempt through the perineal opening. First, if we have the good fortune to encounter a single growth, polypoid in form (see diagrams, in the Table of Cases, Nos. 1 and also 13 and 15), and therefore with a pedicle of no great width, there need be no hesitation whatever in introducing a pair of forceps into the cavity of the bladder, and employing them there without any aid from the operator's finger. The forceps to be used for this purpose are to have rather wide and serrated margins where the blades meet, so as to crush, but without any power to cut the tissues seized. These forceps should be provided in different forms. The first, or simplest pattern, should be straight, resembling an ordinary lithotomy forceps (fig. 14). Others should be curved for seizing tumours which are situated laterally and near to the neck of the bladder, in which last-named position the straight forceps are powerless to grasp the tumour (figs. 15 and 17).



FIG. 14.—Straight forceps.



FIG. 15.—Slender, laterally curved forceps, for removing a growth close to the neck of the bladder



FIG. 16.—The same forceps looked at from the front, so as not to show the curve.



FIG. 17.—Curved forceps for tumours occupying the sides of the bladder.



FIG. 18.—The same forceps looked at from the front.

A pair of each pattern should have cutting edges for exceptional cases, when, for example, the growth is more firm and solid than usual. When the blades are free in the cavity they have merely to be opened easily and widely, and on closing them it is almost certain that they will grasp the polypus more or less completely. The proceeding thus advised is more likely to prove successful in accomplishing its object, than is the attempt to seize a stone in the bladder. But here let it be observed that no suprapubic pressure should be made during this act; nothing should be done to interfere with the natural contour of the bladder. The operator, by light and easy movements of the forceps in varied directions, ascertains that he has the growth within their grasp. My advice is that, above all things, he is not now to pull forcibly, but that he is to press firmly the blades together, biting or chewing a little, if I may use the terms, with the extremities of the blades, without changing the original situation of the bite or grasp. Then a little twisting movement may help to disengage the mass, which if accomplished, the forceps will be felt free, and may be withdrawn with their contents; after which the finger enters to feel what remains, and what more must be done in order to complete the removal. Let me remark, whenever the forceps has removed a portion, however small, the instrument should never be re-introduced until the finger

has again examined the interior, and enabled the operator to form a fresh estimate of the portion remaining, if any, to be removed. But, supposing that the tumour has not been separated by the moderate amount of forceps action described, the operator may disengage and remove them; when on introducing the finger he will probably find the part so nearly

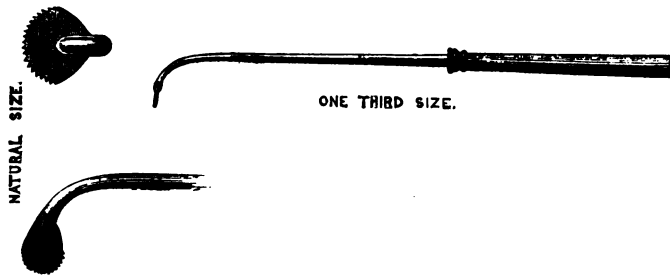


FIG. 19.—Instrument with serrated end for separating by rotatory movement a portion of tumour fixed by the index finger. Seen in profile, one-third natural size. The end is shown in two positions of the natural size.



FIG. 20.—Another serrated instrument, curved in form.

severed that the actual division may be completed with the finger nail; or with one of the little serrated instruments which I have designed for the purpose, and for the employment of which there is ample room through the urethral wound, by the side of the index finger (see figs. 19, 20). There is really no difficulty, nor is there any risk, with ordinary care, in removing

a growth or two of pedunculated form, sufficiently near to the walls of the bladder to render the operation a permanently successful one. I suppose that the ultimate result of dividing the pedicle of a tumour in the manner described is such a cicatrisation of the wound as to prevent the recurrence of outgrowth from that spot hereafter.

But other means may be used according to the judgment of the surgeon. A very small *écraseur*, with violin-string ligature, may be manipulated by the side of the index finger, and used in polypoid forms of tumour. In the cases of women, such a tumour may sometimes be slowly and carefully brought into view by traction on the forceps, and then the pedicle may be ligatured. I have succeeded in doing this in one case; so has Mr. Bryant. In another I drew a polypoid mass within view, and found it was a completely encysted calculus; I then opened the mass, when the calculus escaped.

But in the male it has occasionally happened that the tumour can be drawn through the wound, as happened with Mr. Davies Colley, and also with Mr. Morris, in whose case the growth seemed to have been extruded by natural vesical efforts on the day after operation (having been left untouched on the first), and was then removed, the patient making a good recovery.

But when the growth takes a more complex form

—as when several lobes spring from a wider base, for examples see diagrams Nos. 4, 7, 13, 16, in Table of Cases, pp. 97–111—the forceps must be depended upon for removing them by repetitions of the same process which is employed for the single growth. But when the base is wider still and the growth is less prominent, as that represented in diagrams Nos. 5, 12, 17, 18, 19, it is doubtful whether complete extirpation is possible by any proceeding, either through a perineal or through a suprapubic opening. The wide base involves such intimate continuity of tissue between the coats of the bladder and the structures of the growth, that I believe separation to be mostly impossible; and that ablation of the prominent portions of the growth, when feasible, should be undertaken only with the view of retarding its progress, but with no prospect of effecting complete separation of the disease from the body.

These portions are to be seized and destroyed, partly by removal on the plan just described, and partly by crushing, and thus inducing sphacelus and sloughing of the growth. The question of applying some chemical astringent arises in such cases, and its utility may be regarded, perhaps, as twofold. A solution of the perchloride of iron may tend to check the hæmorrhage, which is almost invariably very free for a few hours after the removal of wide-based growths, and it may partially destroy the portion

which remains after the forceps have done their work. For this purpose I have contrived a straight and also a curved glass syringe containing a small sponge, saturated with solution ; the sponge being pressed by the piston permits the escape through small perforations at the extremity of from 30 to 60 minims of the solution, at the precise spot where it is desired to make the application.

There is one circumstance important to be noted, especially in dealing with the less prominent growths ; and that is, the effect of strong suprapubic pressure made by an assistant in relation to their apparent situation, and their mode of presentation to the finger of the operator engaged in exploring the bladder, and in estimating their size and form. If that pressure is considerable it forces the upper wall of the bladder into its own cavity, and thus gives to the growths a larger contour than they possess, and makes them apparently salient to a much greater extent than they really are. Thus an eager or inexperienced operator, unaware of the effect of strong suprapubic pressure, might be led to seize the mass offered to the forceps, through the influence of this pressure, and under the belief that it was a large growth, he might inflict a fatal wound by crushing a double fold of the coats of the bladder, and so making an opening in the peritoneum. To avoid such a catastrophe it is only necessary, first, to decline the attempt to

destroy any growth which is clearly not sufficiently salient to admit of complete or nearly complete removal ; and, secondly, never to employ the forceps while forcible suprapubic pressure is made ; at least, no more pressure than is desirable just to steady and support the bladder and the parts adjacent.

RESULTS.—We have now, finally, only to consider what are the results which have been attained by the perineal operation in relation to vesical tumours.

Of the twenty cases of tumour, two were in women : one of these died in three days of total suppression of urine ; autopsy showing advanced disease of kidneys (one contained a large calculus), and that no injury was inflicted upon the bladder. The other is now in excellent health, having entirely lost her painful symptoms ; observing a few drops of blood, occasionally, after more exercise than usual : more than two years have elapsed since the operation.

Of the eighteen male cases, five died within three weeks after the operation ; three others died at periods of some months after, two of them from malignant disease developed elsewhere. The other nine are living ; one of these, from whom I removed a tumour in the autumn of 1882, I operated on again, removing a larger growth than the original one last February, and he has again recovered. In four cases no attempt was made to remove the tumour, it being manifestly impossible to do so, but only to diminish it as far as

practicable with safety ; all these recovered well, and are rather better than before. Of the remaining four, one has had no return whatever, four years having elapsed since the operation ; a second has slight signs of a return, one year and a quarter since operation, but works hard for his living at 64 years of age ; a third, who, like the last, was at death's door from loss of blood when I operated, has greatly improved, and is actively employed ; but has recently shown some disposition to bleed after exercise, nearly a year since operation. The fourth was greatly improved, and returned to the active life for which he was before disqualified. The others have too recently been operated on, to furnish any material fact to be reported. More ample details are furnished in the Table of Cases drawn up and accompanying this.

I may thus briefly sum up the record of the numerous facts related. For every one of these patients with tumour, in the natural order of events, one result only was possible. Left without surgical aid, death inevitably awaited each : a fate not merely certain, but necessarily involving protracted suffering.

Whatever surgery can accomplish in the way of saving life for several of these patients is obviously so much clear gain. I am therefore satisfied with what has been achieved for the first twenty cases ; having naturally desired greater success ; but I have reason

to expect that it will be greater in the next twenty cases, through having acquired some valuable experience which I have thus attempted, so far as this is possible, to make useful to others.

We may certainly reckon on ability to save life in a few instances, such as are recorded here ; we may also often prolong valuable life, a fact illustrated by several of the cases recorded both by myself and by other operators.

There is still another result which ought not to be overlooked. Whatever value may have accrued to a few patients in the matter of saving or prolonging life, a matter which is wholly incalculable, there has been an opportunity afforded, on a scale never before met with, for careful inquiry into the external physical characters and histological elements of vesical growths. This research has been systematically pursued ; and with the aid of valuable co-operation already referred to, I have been able to present a scheme for classifying the facts obtained, which I trust may prove to be a contribution, however humble, to an improved acquaintance with this important subject.

I append five of the cases which are most worthy to be reported at length, partly because each more or less illustrates a particular type of growth, together with its history and progress, and the symptoms

associated with it, and partly because the kind of after-treatment and subsequent history are to some extent indicated also. The number to each case corresponds with that which marks its place in the table of twenty cases which follows after.

CASE 1.—T. R., æt. 29. Fibro-papilloma, or transitional (?).

1880, *July* 26. He first consulted me. I learned that eight years previously he had passed 'a piece of gravel the size of a pea.' After this he felt nothing unusual until three years ago, when his micturition became more frequent, and was followed by pain in the end of the penis, also occasionally blood appeared in the urine, especially after exercise.

With these symptoms, I sounded the patient, and I found a small calculus, which on August 5 was easily crushed and removed. It was composed of oxalate of lime.

Very little improvement followed the operation: the bladder was not quite emptied by the natural efforts; the gum catheter was used daily, and on two occasions gave signs of the presence of something in the bladder, which a subsequent exploration of the lithotrite did not discover. Such results were unusual and somewhat puzzling. Being relieved, he resumed his employment, and was occasionally seen relative to the still existing slight symptoms, which, however, gradually increased.

On October 5 I examined the bladder, and removed a quantity of phosphatic deposit with the lithotrite. I then seized what at first felt like calculus, and partially crushed under pressure; but it was evidently fixed, giving me the impression that I was dealing with a portion of stone partially impacted, and that the remainder would be beyond my reach.

1880, *Nov.* 6. I made exploration after median incision

into the urethra in presence of Dr. Seegen of Carlsbad, Dr. Paggi of Florence, and Mr. Ceeley of Aylesbury. Having introduced my finger well into the bladder, and pressure being made above the pubes, I soon recognised a tumour, about the size of a chestnut, growing apparently from the opposite wall or fundus, and somewhat to the patient's left, coated with phosphatic matter, and evidently the fixed body I had formerly seized with the lithotrite and denuded of its sabulous covering. Taking a pair of small forceps, I adjusted them to a full and firm hold, and then twisted off the mass without difficulty; a small piece or two were subsequently withdrawn, but the tumour appeared to be entirely removed, and very little bleeding followed. He had no bad symptoms, made a rapid recovery, speedily regained good health, never having had any return of symptoms since the operation, now nearly four years ago. He is now in perfect health, June, 1884.

Mr. Stanley Boyd, formerly Surgical Registrar of University College Hospital, examined a portion of the tumour from this case, and his report thereon is as follows:—

‘A small piece, taken from the surface of the tumour, was handed to me for examination. It was thickly encrusted with phosphates, and beneath these the surface was finely irregular. On section, the growth was firm and of uniform consistence; but its structure could only be guessed at as fibrous.

‘Microscopically, it consisted of fine bundles of fibrous tissue, having a general direction vertical to the surface. Small round cells were scattered pretty copiously at parts, especially towards the free surface, but there was no regularity in their distribution.’

It might perhaps now be classed as an example of ‘fibro-papilloma.’

CASE 2.—Mrs. F., æt. 30. Fibro-papilloma.

1882, *May* 5. I first saw her with Dr. Philson of Chel-

tenham, and learned that in 1877 she first observed blood in the urine, but had no pain.

In June, 1879, severe cystitis, which became chronic. Throughout 1880-81 much frequency of micturition, but no severe attacks; occasionally blood in the urine.

1882, *February*. Much bleeding. In March, severe cystitis, and confined to her room since.

May 9. Dilated the urethra under ether, detecting a growth (represented by the diagram in the Table) at the centre of opposite aspect of bladder behind and above the trigone; and removed three chief portions with the forceps. Bleeding free at first, subsiding during the day. A catheter was tied in, and remained forty-eight hours. She made a rapid recovery, and left town holding water five hours at the end of three weeks.

The tumour was examined by Mr. Stanley Boyd. See report below.

1883, *February*. There has been slight bleeding lately, and she has come up to town at my desire. Dr. Philson was present. I found a growth near the neck of the bladder about the size of a cherry, which I removed with a pair of laterally curved forceps. At the first operation I had only forceps of the ordinary form used in lithotomy, and could not command any outgrowth thus placed, and only constructed other forceps as fresh circumstances demanded. She soon returned quite well.

1884, *April 17*. I heard there was no frequency of micturition, and that there was no pain. Occasionally, after exercise, sees a few drops of blood.

Mr. Stanley Boyd examined the parts removed, and reported as follows:—‘The growth consisted of three chief masses of roughly spherical form, one-half to three-quarters of an inch in diameter, and having short, narrow pedicles, and of two or three small sessile masses of similar shape. All the nodules were velvety on account of the projection

everywhere from their surfaces of thin folds, and embranched, somewhat club-shaped processes, one-sixteenth of an inch or less in length. Under the microscope these processes consisted almost entirely of one or two very thin-walled vascular loops of wide calibre, but some showed a good deal of round-celled infiltration. They were covered by a thick layer of epithelium, the component cells of which were columnar, very long, and narrow; the epithelium stripped off with the greatest ease. The mass of the tumour consisted of rather loose connective tissue, containing here and there small collections of round cells. No glandular structure was seen. Vessels very large, numerous, and provided with stout coats in the body of the growth, but towards the surface large numbers of the same wide, thin-walled vessels were seen, as were noticed in the processes on the surface. They had no muscular fibres in their walls. The surface of the growth between the processes is covered by epithelium similar to that on the villi. At the base of the nodule examined some bundles of the involuntary muscular layer of the bladder were seen, but no such tissue existed in the growth.'

CASE 7.—W. W., æt. 63. Fimbriated papilloma.

1883, *Jan.* 24. I first saw him. Occupied on the Thames as a bargeman. Seven years ago, the first attack of hæmaturia occurred: severe; the clots causing retention of urine. Several attacks, with rather long intervals, during the succeeding five or six years.

During last year more bleeding; during last month almost continuously seen. All this time he has worked hard at the oar; he bleeds less when resting, but has little pain; holds water two hours or more, night and day. Passes it sometimes quite clear at beginning of stream, ending deep red.

He is very weak, and obviously anæmic from loss of blood.

At this visit he passed in his urine a shred, which, under the microscope, proved to be a perfect specimen of fimbriated papilloma. Hence I decided at once to operate.

Feb. 8. Dr. George Johnson and others present. Found tumour: rather wide base, but prominent; springing from the back of the bladder a little on his right side. I nipped off all the salient portions, leaving a slightly projecting, ragged base. The tube was introduced; it remained five days.

Feb. 20. All urine still by wound; generally a little blood in the urine, which seemed to be checked by mild daily injections of perchloride of iron.

March 2. Up and going about. Very little bloodstain; urine partly passing by urethra.

March 12. No blood for a week; holds urine three hours. Walked an hour yesterday. All the urine by urethra.

April 3. Stronger than for months; has returned to his work.

November 1. Has been working hard all summer and autumn, and occasionally sees a little blood when work is severe.

1884, *April 16.* Called on me. Continues his work. No frequency of micturition; no pain; passed a little urine with faint blood tint.

Dr. Gibbes examined this tumour, and reported upon it as follows:—‘This growth consists of a number of delicate filiform processes: each of these consists of a central stalk from which branch several secondary processes. They are formed of a very delicate connective tissue in the centre, which is infiltrated with small round cells; and they are covered with a stratified layer of columnar epithelium, which resembles that of the normal bladder. This epithelium is set on a nucleated basement membrane; a large blood-vessel enters at the base of each villus and branches as it goes on,

until it finally breaks up into a network of capillaries, which lie directly under the basement membrane. In some places these capillaries may be seen to have ruptured on to the external surface. The whole growth is very vascular. Many of the columnar epithelial cells are distended with mucus. In some of the processes there are crypts lined with columnar epithelium similar to that on the surface.'

CASE 10.—J. S., æt. 53. Fibro-sarcoma, or transitional (?).

1881, *August* 24. I first saw him. Leading an active life; from Wales. Sent to me by Dr. Maguire, of Holyhead. Last six months, micturition frequent, little painful before and after, occasionally slight hæmaturia. Urine healthy, no organic deposit seen; under microscope a few blood corpuscles.

1882, *May* 8. He came up again. Slight advance in symptoms. Sounded: nothing felt worth recording; prostate rather full; blood little increased.

August. Pain increased slightly; a little florid blood lately seen at the close of micturition.

November. Pain increases; rarely three days without marked appearance of florid blood; appetite good; walks three miles, and thinks exercise makes little or no difference. Nothing characteristic in urine.

1883, *March* 2. The last two months blood has appeared every day, and passes water every hour day and night, with much local pain; none in legs or back.

March 3. Digital exploration. Mr. Coward and others present. Felt a large mass more than half filling the bladder, and much harder than growths usually met with. Was compelled to use the forceps with cutting edges, removing great part of it, bit by bit, with great care, examining afresh with the finger after every portion. Very free bleeding for twenty-four hours.

March 5. Blood diminishing. Weak. Abdominal tenderness.

March 6. Urine passes by tube freely; still bloody.

March 7. Died at noon.

March 8. Autopsy showed a portion of tumour about base remaining; of very firm consistence, and apparently continuous with the coats of the bladder. Both kidneys small and pale, the right showing marks of pyelitis.

Mr. Shattock carefully examined the bladder with a view to determine the connection of the growth with the organ, and reports as follows:—‘A vertical section carried through the middle of the tumour and the wall of the bladder shows the morbid growth to be throughout solid, white, of soft consistence, and very evidently constructed of an alveolar stroma, from which the contained elements can be expressed. The growth nowhere extends through the wall of the bladder; the longitudinal muscle-bundles are traceable without interruption beneath its base, though the transverse are unrecognisable in the situation, a result due apparently to a displacement rather than to any proper disappearance from infiltration of the transverse bundles by the tumour.

‘The deep limit of the growth is clearly defined, convex, undulatory or lobular in character; the tumour substance has nowhere extended laterally, its deep limit being in fact its narrowest part. The wall of the bladder beneath the tumour is folded inwards for a depth of nearly half an inch, a condition due, doubtless, to the enforced dragging of the growth upon the subjacent part of the bladder, as the connective tissue and fat lying over this spot are quite lax, and present no induration or cicatricial-like shrinking.

‘A microscopic section shows throughout an alveolar stroma of connective tissue, the wide meshes of which are filled with multiform epithelial cells, many of an elongated form, columnar, pyriform, some with bifid tails, and arranged with the long axis at right angles to the wall of the space which holds them.

‘Taking all the facts together, there is no evidence that the tumour is malignant.’

CASE 12.—C. C. S., æt. 56. ‘Transitional.’

1883, *January* 11. I first saw him. Habits sedentary. About a year and a half ago severe attack of painful micturition, followed by more or less irritation ever since.

Three months ago, first saw blood in the urine, after a long walk. Has recurred frequently since.

Now, there is considerable frequency of micturition, pain, and often blood. Sounded: nothing found; the bladder empties itself by its own efforts. Rectal examination reveals nothing; in the urine, no signs of tumour débris.

He returned to the country to carry out some treatment advised; but his symptoms becoming more severe, he came to town again.

April 3. Sounded and otherwise examined under ether: nothing discovered; a ‘softish’ feel in rotating the sound. Tried mild injections of perchloride of iron. He passed some small phosphatic concretions a week or two later. As he made no progress, I decided to explore with the finger.

May 4. The brother Dr. S., and others present. I found a broad sessile tumour occupying (his) right side of bladder; one which it was clearly impossible to remove, since its incorporation with the walls of the bladder was manifest. I nipped off two of the most salient portions of the mass, diminishing it considerably, and put in the tube. It remained two days, when all bleeding ceased. He left for the country, the wound being healed and symptoms relieved, on *May* 24.

1884, *May* 10. Came up again to see me, with much frequency and pain, but with little bleeding; troubles mainly due to some phosphatic deposits, which were removed by lithotrite and aspirator under ether; and he left again, relieved, but suffering much at times, on *May* 20.

Dr. Gibbes examined this tumour, and reported upon it as follows:—‘This tumour appears to be an hypertrophy of the submucous coat of the bladder. The muscle appears normal, but the tissue inside it is composed of dense bands of fibrous tissue, which are irregular in direction, and which have here a macerated or sodden appearance, as if there had been great œdema into them. Nearer to the epithelium the fibrous tissue is much finer, and directly under the epithelium it has a reticulated appearance, exactly resembling granulation-tissue in the bottom of a healing wound. The epithelium on the surface resembles that of the normal bladder in every respect. The blood-vessels in the depths have very thick walls, and are surrounded with round cells in some places. The capillaries run directly to the surface, generally without branching, and are there ruptured in many places. They are also ruptured in some parts of the deeper tissue, and there are many spots of extravasated blood. There are collections of round cells, and numerous irregularly shaped large cells, in some places resembling “lymphoid” tissue, and these are arranged in round or oval masses.

‘There are no papillomatous or “villous” growths in that portion of the tumour examined.’

The microscopic drawing, Plate V., was taken from the above described tumour.

**TABLE OF CASES OF OPERATION FOR
VESICAL TUMOUR.**

TABLE OF TWENTY CASES OF OPERATION 1

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complications with calculus
1880, Nov. 6	1	T. R.	29	3½ years	Blood in the urine	Not examined, no growth being expected; the operation was made for a supposed encysted calculus	A small late of and phatic culus crushed
1882, May 9	2	Mrs. E.	30	6 "	"	Ditto	—
Nov. 3	3	B. G.	46	1 year	Frequent micturition; blood much later	Much large cell-growth; various forms	—

CAL TUMOUR BY SIR HENRY THOMPSON.

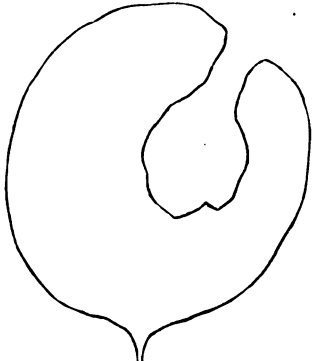
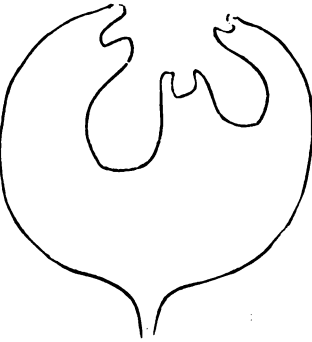
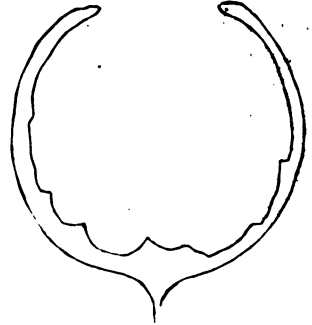
Kind of tumour	Operation and result	Diagram of form and situation of tumour
Polypoma	Single polypoid growth; removed at base by forceps. Dr. Paggi, of Florence, Dr. Seegen, of Carlsbad, and Mr. Ceeley, of Aylesbury, present. Rapid recovery. Living and well, spring 1884	
Papilloma: 'club-shaped processes,' not a papilloma (Mr. S.)	Polypoid growths; removed by forceps; recovery rapid. Seen with Dr. Philson, of Cheltenham. February, 1883. Removed a small growth which I had been unable to grasp at first operation for want of forceps acting laterally; she was well in a few days and returned. 1884, April 17: heard that she is quite well; there is no frequency of passing water; no pain; after exercise a trace of blood is sometimes seen	
Polyps intermediate between polypoma and papilloma. Probably belonging to group termed 'transitional' (Mr. S.)	Very large; almost entirely removed by forceps; great hæmorrhage; died few days after operation; no autopsy permitted; probably some giving way of bladder at base of tumour	

TABLE OF TWENTY CASES OF OPERATION F

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complication with calculus
1882, Nov. 20	4	Dr. M.	52	5 years	Blood in the urine	Shreds formed of fusiform cells	—
1883, Jan. 17	5	E. K. G.	67	6 "	"	Ditto	A small acid calculus
" 30	6	T. F.	67	3 "	"	Numerous fusiform cells and fibres	—

BL TUMOUR BY SIR HENRY THOMPSON (*continued*).

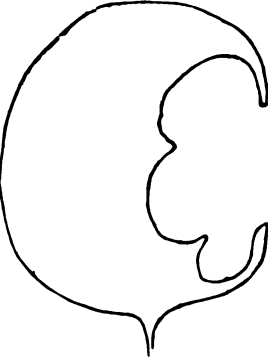
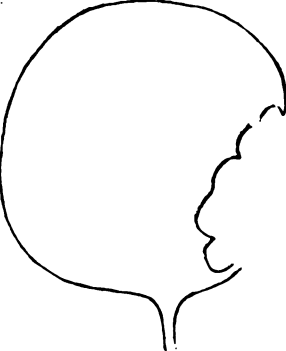
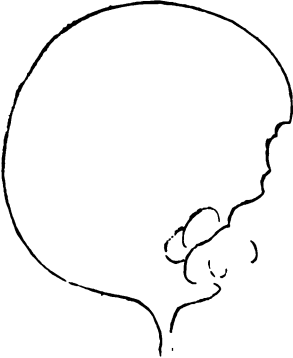
tumour	Operation and result	Diagram of form and situation of tumour
of the contains i muscu- not con- into the processes, arise in number, m long Normal tissue mbriated (Dr. H.	Rather broad-based growth, springing from side of the bladder. Seen with Dr. Geo. Johnson. The patient was free from bleeding for nearly six months after operation; then little blood seen after a seven miles' walk, and continued. In June, 1883, I made a slight exploration and removal, followed by relief. On February 10, 1884, I again explored, and removed a larger quantity than on either previous occasion; the bleeding had been very severe during the preceding two months. He made a slow recovery, being much exhausted prior to the last operation	
; resem- ncture of rts' (Mr.)	Sessile, and partially removed. Returned to Cape; probable reappearance of the tumour. Heard of his death there subsequently	
na (Dr. s)	Broad and sessile; removed much of it. Signs of reappearance of tumour in the spring; and in the summer he died	

TABLE OF TWENTY CASES OF OPERATION FOR

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complications with calculus
1883, Feb. 8	7	W. W.	63	7 years	Blood in the urine	Well-marked villous growth	—
" 21	8	J. M.	64	1 year	"	Never found any characteristic débris in urine	—
" 27	9	Mrs. O'R.	65	7 years	"	Large spindle-shaped cells	Calculus left kidney large; both kidneys diseased; pyelitis

VESICAL TUMOUR BY SIR HENRY THOMPSON (*continued*).

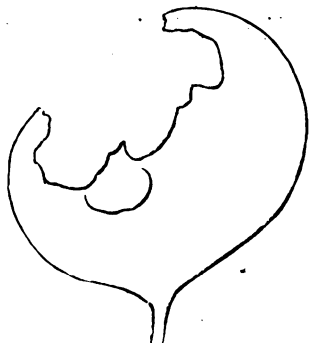
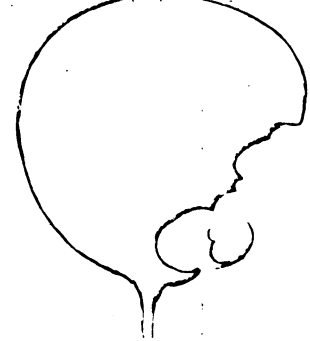
Nature of tumour	Operation and result	Diagram of form and situation of tumour
Fimbriated papilloma chiefly; very vascular (Dr. H. Gibbes)	Rather broad-based polypoid growth; freely removed. He was so weak with long-continued hæmorrhage, I almost feared to operate. Living and well in the spring of 1884, working as a bargeman on the Thames. Seen with Dr. Geo. Johnson	
Composed of normal bladder tissue; fimbriated papillæ ('villi') abundant; no structure resembling malignant growth was found (Dr. H. Gibbes)	Broad and sessile; removed rather freely. Died two months after with secondary malignant growth in thigh. Seen with Dr. Harvey, of Bayswater	
Papilloma (Mr. Eve)	Large tumour, freely removed, leaving the base, which was broad. Died three days after with suppression of urine. Seen with Mr. Thurland, of Wilmington Square, with whom autopsy was made. Kidneys much diseased; large calculus in the left	

TABLE OF TWENTY CASES OF OPERATION 1

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complications with calc
1883, Mar. 8	10	J. S.	53	2½ years	Frequent and painful micturition. Blood at later stage	No characteristic debris found	—
„ 80	11	W. D.	65	1 year	Blood later	Numerous long cells and fibres	—
May 4	12	C. C. S.	56	2 years	Pain first; blood later	Nothing found	—

VESICAL TUMOUR BY SIR HENRY THOMPSON (continued).

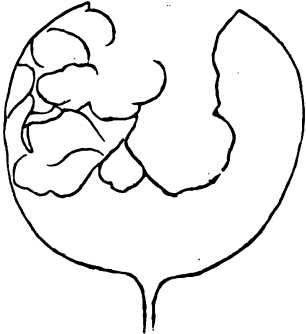
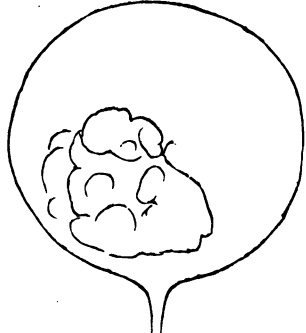
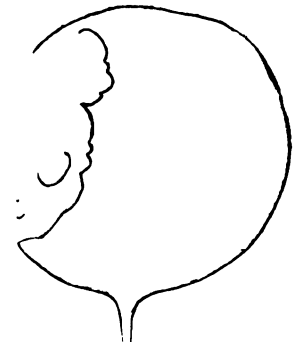
Nature of tumour	Operation and result	Diagram of form and situation of tumour
Tissues like those forming the wall of the bladder, with fimbriated papillæ (Mr. Shattock)	Large hard tumour partially removed; largely involving the coats of the bladder. Died few days after operation. Sent to me by Dr. Maguire, of Holyhead	
Tissues like those of the walls of the bladder, and some papilliform growth in small quantity on surface (Dr. H. Gibbes) Fibro-papilloma	Sessile; firm; removed salient portions. Died fourteen days after operation, of exhaustion. Seen with Mr. T. W. Mason, of Regent's Park	
Example of growth termed 'transitional.' The structure resembles a 'hypertrophy of the submucous coat of the bladder; collections of round cells in some places resembling lymphoid tissue; no papillomatous growth present' (Dr. H. Gibbes)	Tumour firm, sessile; inseparable from walls of bladder; removed salient portions only. Living; symptoms relieved at present; probably from drainage of bladder. 1884, May 10: came to see me; washed out many small phosphatic concretions with great relief. Tumour not much increased; occasionally some blood in urine; on the whole the symptoms not worse	

TABLE OF TWENTY CASES OF OPERATION 1

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complications with callosities
1883, May 9	13	T. Q.	52	4 years	Frequent micturition and pain. Blood seen two years ago	Passed mass, the size of large pea, of soft fleshy material in urine; when examined by Dr. H. Gibbes appeared to be portion of growth, composed of normal vesical elements	None
June 27	14	A. G. S. C.	57	" "	Frequent micturition: soon after an attack of bleeding	No cells of suspicious appearance found in the urine	—
July 7	15	J. H. B.	40	3 "	Blood seen at the first; now daily and profuse bleeding. Micturition never very frequent	No evidence obtained from the urine	—

VESICAL TUMOUR BY SIR HENRY THOMPSON (*continued*).

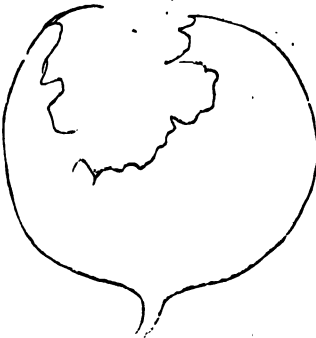
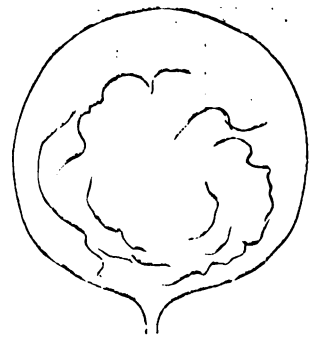
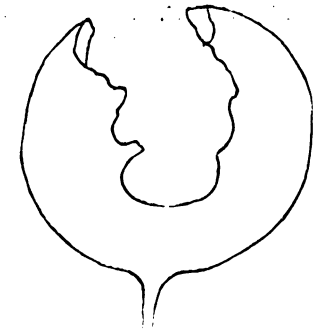
Nature of tumour	Operation and result	Diagram of form and situation of tumour
Made up of unstriped muscular fibres, with numerous tubes and crypts lined with columnar epithelium; probably malignant (Dr. H. Gibbes)	A soft growth, removed to the base. Much bleeding up to second day; became feverish, indisposed to take food, and gradually sank on the twelfth day. Mr. W. Adams, of Regent's Park, was present at the operation	
Made up of unstriped muscular fibres; numerous small cells interspersed; numerous fimbriated papillæ (Dr. H. Gibbes)	Sessile growth, implicating the walls of the bladder, and could only be partially removed. Rapid recovery. Dr. Weir, of New York, was present. Had no bleeding for two months after operation. April 17: micturition frequent and painful; much blood at times; the growth evidently increasing	
The body of the tumour made up of normal elements of the vesical walls with here and there infiltration of small round cells. Abundant fimbriated processes, 'villous' from every part	A rather large polypoid growth removed entire at once. Recovery rapid. An assistant to Dr. Bell, of Rochester. Professor Holmer, of Copenhagen, present. He was so reduced by persistent hæmorrhage, that I operated with great reluctance. 1884, April 20: he writes that he is actively employed, but has seen after exercise 'occasionally a few drops of blood, just as he did three or four years ago;' 'health good'	

TABLE OF TWENTY CASES OF OPERATION I

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complicat with calculi
1883, Nov. 16	16	T. S.	42	8 years	Attacks of hæmat- uria; of late mic- turition frequent	Shreds of tissue passed, made up of, spindle-shaped cells and fibres with nu- clei on them	—
1884, Feb. 5	17	D. of B.	50	nearly 4 years	Attacks of frequent and painful mic- turition, with little blood	Shreds of tissue washed out show villous structure	—
Mar. 12	18	W. G.	69	—	Blood occasionally seen eight or ten years ago; last four years very often; frequent micturition only recently	Shreds of tissue washed out show numerous large nu- cleated spindle- shaped cells	—

ICCAL TUMOUR BY SIR HENRY THOMPSON (continued).

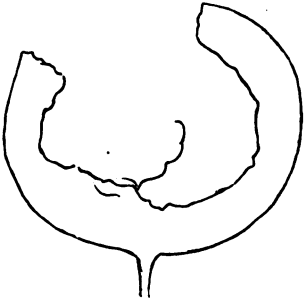
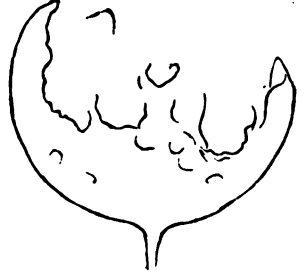
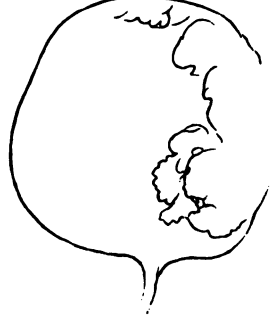
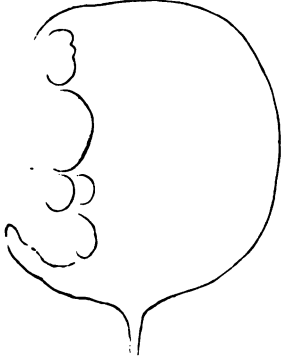
Nature of tumour	Operation and result	Diagram of form and situation of tumour
al structure bladder covered with fimbriated papillæ; groups of 12 cells are in places in substance of papillæ (Dr. Gibbes)	Growth like a cauliflower, from rather wide base; removed all but the latter; A good recovery. Seen with Mr. Woodcock, of Knutsford, Cheshire, who was present at the operation. 1884, May 10: called on me. He attends to the active duties of his profession as land-surveyor, but after more exercise than usual sees a little hæmorrhage. Has been busily occupied some days in London and seen no blood; no frequency or pain in micturition	
al structure bladder, with numerous large villæ, from which spring the fimbriated masses in abundance; a few acytes seen (H. Gibbes)	A firm broad-based growth from the back of the bladder; from which I removed the salient portions; and it appeared to me that a suprapubic operation would not enable me to remove the tumour entire. June 3: symptoms now very slight; no pain; walks three miles without seeing blood	
al structure bladder chiefly; long papillæ 'villi,' but d papillæ covered with stratified columnar epithelium (Dr. H. Gibbes) o-papilloma	A broad-based sessile mass, of firm consistence, involving the coats of the bladder; it would be useless, therefore, to propose suprapubic operation. Removed two or three salient portions. He gradually sank, about three weeks afterwards. Seen with Dr. Geo. Johnson, who was present at the operation	

TABLE OF TWENTY CASES OF OPERATION I

Date of operation	No.	Case	Age	Duration of symptoms	Earliest sign observed	Result of urine examination	Complications with calculus
1884, April 4	19	F. J. O.	58	9 months	Severe bleeding first	Nothing found in the urine	—
May 30	20	R. S. R.	63	15 „	Bleeding after exercise was the first sign	Fragments removed from the bladder by the aspirator, nothing being found in the urinary deposit by simply washing out	—

VESICAL TUMOUR BY SIR HENRY THOMPSON (continued).

Nature of tumour	Operation and result	Diagram of form and situation of tumour
Normal structure of bladder chiefly; groups of small round cells; some like inflammatory cells: resembling Cases 12, 14, and 16: and regarded as 'transitional.' No long papillæ (Dr. H. Gibbes)	A firm broad sessile tumour, with very slight lobulation; could not be separated from walls of the bladder. Removed a small portion for examination. Wound soon healed. Seen with Dr. Dove, of Pinner	 A line drawing of a bladder in profile, showing a broad, sessile (non-stemmed) tumour on its right wall. The tumour has a slightly lobulated surface and extends from the top to the bottom of the bladder's main body.
Normal structure of bladder, covered with columnar epithelium; under latter, round cells like 'lymphoid tissue;' somewhat uncertain (Dr. H. Gibbes)	A firm multilobular tumour, with broad peduncle, which was removed almost level with the walls of the bladder. Dr. Shippen, of New York, and Dr. Charamis, from Paris, present. Recovering rapidly. June 7, 1884	 A line drawing of a bladder in profile, showing a multilobular (multi-lobed) tumour on its right wall. The tumour has a broad, stalk-like peduncle at its base and several rounded lobes extending upwards and outwards from the bladder wall.

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LONDON: NEW BURLINGTON STREET.

Printed by Danks & Sons, Printers,]

[Paternoster Row, and Wine Office Court.

